FEEDSTUFFS

★ A WEEKLY NEWSPAPER ★

FOR THE FEED MANUFACTURER, JOBBER, BROKER and DEALER

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Hogs and Broilers to Pace '59 Livestock Increases

CHICAGO — "Fourteen per cent more hogs and 10% more broilers will pace increases expected for most classes of livestock in every major section of the country during the next 12 months. Increased supplies of high protein feeds and an abundance of grains and millfeeds will be more than ample for these birds and animals."

So stated the feed survey committee of the American Feed Manufacturers Assn. at the conclusion of its recent two-day meeting in Chicago.

The 24 college and experiment station men comprising the committee represented every major feeding section of the U.S. They include economists, and representatives from dairy, poultry and animal husbandry departments, as well as deans of several colleges of agriculture.

This was the 17th annual meeting of the feed survey committee sponsored by AFMA. Last year's report was accurate within 2%.

In addition to increases in hogs and broilers, 5% more turkeys, 4% more sheep and lambs, and 3% more beef cattle and layers are also expected next year, according to the committee. Declines of 2% for dairy cows, 4% for horses and mules, and 6% for other chickens raised for flock replacements are anticipated by the college experts.

At estimated rates of feeding, nearly 130 million tons of grains, oilseed meals and other concentrates will be consumed during the 1958-59 feeding year, beginning Oct. 1. This compares with estimated supplies available for feed of 186 million tons—an excess of 44%.

Grain supplies exceed feed requirements by nearly 50%, while high proteins are in excess about 10%. The latter group includes 450 million bushels of soybeans available for crushing. A crush of 375 million

(Turn to SURVEY, page 143)

USDA Says:

Record Feed Supplies Dominate 1958-59 Outlook

WASHINGTON—Record feed supplies now on hand dominate the outlook for feed in 1958-59 and for the next few years, according to a report this week by the U.S. Department of Agriculture.

Bumper feed grain crops in 1957 and 1958 have boosted supplies of feed grains and other concentrates sharply during the past two years. The record supply of 242 million tons for 1958-59 is 10% larger than that of 1957-58 and nearly a third over the 1952-56 average.

Also in prospect are record supplies of hay and high protein feeds. Total tonnage of high-protein feed available for feeding is about 4% larger than the supply last year.

(Turn to SUPPLIES, page 143)

ADM Names New Top Officers

MINNEAPOLIS — Directors of Archer-Daniels-Midland Co. this week elected Thomas L. Daniels, president of ADM since 1947, to the post of chairman of the board and named John H. Daniels, formerly vice president and manager of the formula feed division, president and chief executive officer.

Richard G. Brierley, formerly vice president and manager of the alfalfa division, was named executive vice president.

The new top executives were announced following the company's stockholders' meeting. All other officers were reelected, and all directors were reelected except Grant Keehn, New York, who retired from the board.

Third Generation

In assuming the presidency of ADM, John Daniels is the third gen-

(Turn to ADM, page 4)

Price Forecast:

USDA Sees Lower Trend For Feed Grains, Protein

WASHINGTON—Lower feed grain prices and lower but more stable high protein feed prices are expected in 1958-59, according to a report from the U.S. Department of Agriculture this week.

The feed grain prices will probably average a little lower, the report said, largely as a result of record 1958 production. Other bearish factors are lower price supports for 1958 crops of corn, barley and sorghum grain and the anticipation of lower livestock prices than those of 1957-58.

Seen as possible offsetting factors, however, are an increase in livestock production and better quality 1958 corn and sorghum crops which will make a larger percentage of these crops eligible for price supports.

High protein feeds this fall and winter may average a little higher than a year earlier, but they are expected to be much more stable during the year, averaging below the high 1958 levels during the spring and summer of 1959, the report said.

Feed grain prices this fall and

(Turn to PRICES, page 8)

Purina to Purchase Oilseed Facilities

ST. LOUIS—The Ralston Purina Co., St. Louis, has reached an agreement with the Buckeye Cellulose Corp., Cincinnati, whereby Ralston Purina will purchase four of the Buckeye firm's oilseed processing plants.

The agreement was announced by Donald Danforth, chairman of the board of Ralston Purina.

The Buckeye plants involved in the transaction are soybean crushing plants at New Madrid, Mo.; Raleigh, N.C.; Louisville, Ky., and Memphis, Tenn. (the Binghampton plant).

Meanwhile, the Buckeye firm, a subsidiary of Procter & Gamble Co.,

(Turn to PURINA, page 143)

Integration, Nutrition, Feeds Handling Covered at Nebraska

By THOMAS E. LETCH
Feedstuffs Staff

LINCOLN, NEB.—College specialists and industry personnel combined their talents to cover a variety of important topics during the 10th annual Nebraska Feed & Nutrition Conference. Held on the agricultural college campus of the University of Nebraska here Oct. 30, the conference attracted about 160 registrants.

Nutrition subjects diescussed included the use of tranquilizers, the effects of mechanical drying on the nutritive value of feeds, losses in stored silage and physiological factors in feed efficiency. An integration panel and information on mechanization of feed handling for livestock and poultry rounded out the program.

Here are summaries of the talks and discussions presented:

A NUTRITIONIST LOOKS AT THE FUTURE OF THE FEED INDUSTRY—Dr. W. W. Cravens, director of feed research and nutrition, McMillen Feed Mills, Decatur, Ind.: The future will be bright if we are prepared for it. Times are changing and we must change with them or we will be passed by.

The feed industry exists only to give service to livestock and poultry producers. Although service covers a

(Turn to NEBRASKA, page 139)

FEEDSTUFFS *Features This Week*

PRODUCTION: The Feed Production School, being held Nov. 12-14 in Kansas City, again focuses special attention on feed plant operations. And in line with this, Feedstuffs this week presents several articles dealing with some of the topics which will receive emphasis at the school:

Custom Milling 18
Bulk Handling 30
Merchandising Bulk 58
Pelleted Rations 64

LAYER NUTRITION: Dr. F. W. Hill outlines new viewpoints in the nutrition of layers. See page 40.

LINEAR PROGRAMMING: Future prospects for use of programming, including a computer-controlled feed mill, are described on page 84.

MERCHANDISING: An article on page 98 tells how a retail firm offers a well rounded feed milling service.

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Feed Cooperatives To Sponsor Joint Research Program

BLOOMINGTON, ILL.—Plans are underway for 12 regional cooperative feed manufacturers to expand their research and evaluation test programs on swine and steer feeds at a central research center near Bloomington, it was announced this week.

Sponsoring cooperatives are: Illinois Farm Supply Co., Chicago; Cooperative Mills, Baltimore; Cotton Producers Assn., Atlanta; Farm Bureau Cooperatives Assn., Columbus, Ohio; Farmers Cooperative Exchange, Raleigh, N.C.; Southern States Cooperative, Richmond, Va.; Pennsylvania Farm Bureau Cooperative Assn., Harrisburg, Pa.; Farm Bureau Milling Co., Hammond, Ind.; Indiana Farm Bureau Cooperative Assn., Indianapolis; Farm Bureau Services, Lansing, Mich., and Wisconsin Service Cooperative, Madison.

Interested also is United Cooperatives, Alliance, Ohio. This organization will be supplying and testing many different types of swine and cattle feeding equipment on the farm.

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EDITORIAL STAFF—George L. Gates, Editor; Roger Bergland, Managing Editor; John Cipperly, Washington Correspondent; Emmet J. Hoffman, Merchandising Editor; John S. Franklin, James E. Sharon and James H. Ross, Editorial Assistants; Duane F. McKenzie, Research Director.

WASHINGTON CORRESPONDENT—John Cipperly, 604 Hibbs Building, Washington, D. C., Telephone, Republic 7-8534.

ADVERTISING STAFF—Wilfred E. Lingren, Advertising Director; Carl R. Vetter, Advertising Department Manager; Bruce A. Kirkpatrick, Advertising Production Manager; Leland C. Hubert, Assistant Advertising Production Manager; R. Dale Swenson, Promotion Manager.

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BRANCH OFFICES—SOUTHWEST, Martin E. Newell, Manager; Thomas E. Letch, Assistant Manager, 612 Board of Trade Bldg., 1005 Wyandotte St., Kansas City 5, Mo. (Tel. Victor 2-1350); EASTERN STATES, Paul L. Dittemore, Manager; George W. Potts and James W. Miller, Advertising Sales Representatives, Suite 3214, 551 Fifth Ave., New York 17, N. Y. (Tel. Murray Hill 2-2185); CENTRAL STATES, Don E. Rogers, Manager; Henry S. French, Assistant Manager; Amos W. Standish, Advertising Sales Representative, 2832 Board of Trade Bldg., 141 W. Jackson Blvd., Chicago 4, Ill. (Tel. Harrison 7-0515); NORTHWEST, Paul A. Anderson, Advertising Sales Representative, P. O. Box 67, Minneapolis 40, Minn. (Tel. Franklin 4-5200).

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Where to Get 'Em

THE GROWING POPULARITY of pelleted feeds, both "regular" formula feeds and those including the roughage portion of animal rations, has been getting a generous share of feed industry attention over the past several months. Those alert to the values of supplying more feed in the handy pelleted or crumblized form in a variety of feeding situations have been building good acceptance for their product among feeders.

Leadership in this development has sprung from a number of sources—the experiment stations, some big time feeders, equipment manufacturers and, of course, most importantly, from feed manufacturers. There are a number of ways to measure the impact of a development such as this, but among the surest ways is to have a look at what farmers are saying about it in farm publications and what the farm publications themselves are saying.

HERE IS WHAT WE MEAN, quoting a headline from the current issue of Farm Journal: "Pelleted Feed: Livestock News of the Year." Holding nothing back, the article starts out like this: "Not for years—and some might say never—has a development come along that promises to 'shake things up' in the farm world as much as pelleted feeds. They could drastically change the way you feed, the kind of machinery you use, the buildings you need, even the crops you grow. Hardly a segment of animal agriculture will go untouched.

"It's too early for anyone to tell how fast these changes will come. But come they will. And they will be major. Every day more farmers and ranchers are feeding pellets . . ."

The article proceeds with a roundup of experiences of farmers and ranchers who report good results in feeding pellets. Pellets used by different feeders may include, as a large portion of the ration, such things as cottonseed hulls, whole grains, whole corn plants, corn silage, coastal Bermuda grass, alfalfa, 'sweet' sorghum, oat hulls or low-quality hay. Protein concentrates, molasses, vitamins and minerals in varying proportions round out the rations.

FARM JOURNAL POINTS OUT that increasing availability of pelleting machinery and pellets has been a big factor in the popularity boom for pellets. Some farmers and ranchers are making their own, but as the magazine points out, the "easiest way to get pellets is to buy 'em—have the feed dealer come out and fill your self-feeder." Some dealers now are providing on-the-farm pelleting service with mobile units, and more custom millers are installing pelleting equipment to enable them to stay competitive with complete feed manufacturers who pellet feed.

The acceptance that pelleted feed already has among feeders undoubtedly will be given an additional spurt by appearance of articles in farm publications such as this one. It is up to the feed industry to continue to make its facilities provide "the easiest way to get pellets" for those feeders who can recognize economic value in use of feed in this form.

Still on the Books

THOSE WHO STILL BELIEVE in allowing economic laws to determine prices will be happy to get the word from a U.S. Department of Agriculture economist that the law of supply is still on the books. Frederick V. Waugh, in a recent USDA publication, points out that almost everyone accepts the law of demand—that consumers will buy more at a low price than at a high price.

Apparently, however, the companion law, which states that farmers will produce more at high prices than at low prices, has been in some doubt. Or, at least, it hasn't been easy to make sure about it. The subject hasn't been easy to study because it takes a while for a change in price to affect supply. Production of farm products can't respond immediately to price, and the farmer must try to forecast his likely price when his products will be ready for market.

Now, Mr. Waugh reports, mathematicians, economists and statisticians are using higher mathematics and new electronic calculators to work on the problem. They find that the law of supply still works in agriculture, and these findings are holding up well under the scrutiny of professional review. Only some crops have been studied so far. Among those needing more work are livestock and livestock products.

Fast machines are working on the problem of slow response, and when all the facts are gathered together it is hoped that they will get wide understanding in Congress, where injections of political law often have gummed up the workings of economic law.

A FEEDSTUFFS FORMULA FEEDS: HOW'S BUSINESS? FEATURE

While formula feed demand continued somewhat spotty over the nation during the past week, the trend appeared to be upward. The large number of animals on feed, good feed-price ratios, completion of fall farm work and the approaching cold weather are all seen as factors pushing demand upward. The index of wholesale feedstuff prices gained 1.1 points during the week ending Nov. 4 and was 77.9 for the week, the U.S. Department of Agriculture reports. A year earlier it was 72.6. The feed grain index went up 1.4 points to 61.0, as against 66.2 a year earlier. The hog-corn ratio, based on Chicago prices, edged up to 17.3 for the week. A week earlier it was 17, and a year earlier it was 14.2. (Ingredient price details on pages 140-142.)

Northwest

Mill representatives reported spotty feed business in the area this week. Their reports added up to a volume about equal to or possibly down slightly from the previous week. Compared with a year ago, demand continues to be much improved.

Some mills have reduced shifts during the week, but production time has been good, they said. The outlook is for continued improvement in demand. Cold weather is now moving in, and is expected to change the demand picture soon.

Dairy and beef feed volume has been increasing in recent weeks to take up the slack from falling turkey demand. Egg feed pickups were also reported by some representatives.

Hog feed demand continues to be good, and starters also were reported to be moving well.

Higher prices for millfeeds, soybean meal and linseed meal will result in higher formula feed prices next week.

Northeast

Mills were forced to trim their running time a little as demand for formula feeds suddenly tapered. There hasn't been any bad weather in most areas of this region and manufacturers still have to contend with a lot of afterfeed on the farms.

The potential for a strong formula feed market just isn't here at the present time. The broiler market provides no incentive for buying and turkeys are streaming to the freezers.

Egg mashes are the backbone of the feed industry now and dairy feeds are holding up well. With the broiler market dragging and turkeys rapidly going out of the picture—egg mashes and dairy feeds will have to carry the brunt of turnover until after the first of the year.

Broiler prices averaged out at only 15¢ lb. in the East. Eggs tumbled a bit and were off 2 to 3¢. Milk, however, still is holding firm.

The ingredient market held steady, with price improvement shown in some items.

Corn was up 1 to 2¢, mostly because of a lack of nearby offerings. Oats were unchanged to up 1¢ on the better grades. Much of the new oats crop is of poor color and consumers are willing to pay a premium for the desired quality. Barley and feed wheat were unchanged.

Soybean oil meal (44%) rose $1.50 and the 50% meal also gained about a similar amount. One trade source couldn't pinpoint the reason for the rise. He said, "There's plenty of it around."

Linseed oil meal advanced 50¢ and gluten meal held unchanged.

Fish meal is practically non-existent and prices rose $3 to $4. Meat scraps held unchanged.

Alfalfa meal continues to edge up. Distillers' grains were quoted in a wide range of prices. Hominy scarcely held its own and was off $1. Gluten feed held steady and brewers grains were unchanged.

Bran and middlings moved up on demand from mixers.

Running time of formula feed manufacturers dipped to 36 hours last week from 40 hours in the previous week.

Southwest

Good formula feed business prevails in the Southwest, with the sales pace generally a little more brisk this week than last. Cattle feed movement is getting most of the credit for the pickup, and in some cases, mills are working extra crews to keep up with the orders.

Poultry feeds are in better demand and are leading items for a number of mills. Turkey feeds have dropped to their low point for the time being, it is felt, since those birds not sent to market this week will be held for the Christmas season.

Swine feeds continue to move in substantial volume. Good demand for pig starter is leading several feed manufacturers to the conclusion that multiple farrowing is more prevalent than it has been.

Prices are said to be a possible factor in this week's improved tone. Rises of from $1 to $3 are looked for on cards for next week. This rising trend may have stimulated dealers and farmers to buy a little heavier than they have been. Harvest chores have been pretty well completed, too, enabling feeders to concentrate more on their livestock and poultry. Cattle feeds have received impetus from dry weather that has kept wheat pastures from being in too good shape.

Mills are running five to six days, an average of two shifts. Several mills have added extra shifts or have been working overtime to hold down backlogs.

Southeast

Feed business is reported to be good and improving throughout the area. Progressive improvement is expected in practically all types of mixed feed through the winter months.

Feed prices have been steady to higher for the most part, according

(Turn to MARKETS, page 145)

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Renderers Look to Future; Cite Increased Fat in Feed

By HENRY S. FRENCH
Feedstuffs Staff

WASHINGTON — The foundation was laid at the 25th anniversary convention of the National Renderers Assn. to assure that all its future birthdays will be causes for celebration. A record 370 delegates attended the meeting, held at the Statler-Hilton Hotel, Washington, D.C., Nov. 2-5.

A program designed to augment present markets for animal by-products, while searching for new uses, took shape at the meeting. Active measures are to be taken to protect and expand the market in the feed manufacturing industry, and more concentrated attention is planned for the export field. A broadened research program is in the works.

Fat Use Increases

The future for products of the rendering industry, particularly animal fats, seems bright, said W. E. Glennon, president of the American Feed Manufacturers Assn., Chicago, during an address Nov. 5. He commended the association for its research work and cooperation in developing a large market in the feed industry for fats and animal proteins.

Mr. Glennon believes feed tonnage will continue to increase. This year, he said, volume is expected to exceed 39 million tons.

Ralph Van Hoven, Van Hoven Co., Inc., St. Paul, new president of the renderers' group, said that the feed industry absorbs almost 500 million pounds of animal fats annually, a startling increase from only five years ago when original research was done by the American Meat Institute Foundation, Chicago, to encourage further use of fats in feeds.

Export Market

The session the morning of Nov. 5 was concerned with the export market. Around 40% of tallow and grease now is being absorbed by off-shore outlets. Martin J. Rubin, H. M. Rubin Co., Inc., Long Island City, N.Y., new first vice president of the NRA, presided at this session. He expressed appreciation for the amount of help the government has given in developing such outlets. Japan has been given more intensive development as a market for fats, and possibilities of the market in Europe and Central and South America have been explored through the cooperation of the Agricultural Research Service and the Foreign Agricultural Service.

Research Program

Richard B. Mortimer, Peterson Mfg. Co., Los Angeles, Cal., retiring president, and Roger E. Morse, James F. Morse & Co., Boston, Mass., offered a joint support of the association's research program. The research budget this year is $90,000, but at the next directors' meeting, a special assessment of $40,000 is to be voted on to further the research program for next year.

Mr. Mortimer, in further discussing the value of market development programs to the NRA, stressed the increased world stature gained by the NRA in addition to the extension of markets.

Max Myers, administrator of the Foreign Agricultural Service, said that the best hope for increased exports of all U.S. farm commodities lies in a general upswing in world economic activity, and a relaxation of world tensions. He said every effort is being made to bring about a lowering of world trade barriers to the export of U.S. farm products.

John J. Hamel, Jr., Valley Chemical Co., Mt. Pleasant, Mich., executive director of the association, taking an overall view of the association and the sphere of its influence, commented on the success of the organization's efforts in the last few years. Improved procurement and processing methods have been devised, and market development programs have taken care of the surplus temporarily. Research has worked, and further efforts are expected to return benefits.

Officers Elected

At the luncheon Nov. 4, Mr. Mortimer, retiring president, was recognized for his contributions to the rendering industry during his three-year tenure in office. He was presented with a scroll and a 300-year-old combination gun, axe and hammer to add to his extensive antique firearms collection.

New officers, installed at the luncheon, are Ralph Van Hoven, Van Hoven Co., St. Paul, president; Martin J. Rubin, H. M. Rubin Co., Long Island City, N.Y., first vice president, and Robert J. Fleming, National By-Products, Inc., Des Moines, second vice president. Miss Jamie C. Fox, Chicago, was reelected secretary-treasurer, and John J. Hamel, Jr., Valley Chemical Co., Mt. Pleasant, Mich., was reelected executive director.

Use in Feeds

The afternoon was given over to important facets of the use of products of the rendering industry in formula feeds. Mr. Van Hoven presided. Dr. Gerald F. Combs, University of Maryland, College Park, Md., discussed "Efficient Poultry Rations."

The aim of the feed manufacturer, Dr. Combs said, is to produce the most efficient feed at the lowest cost. This involves a constant balancing and interchange of ingredients reflecting market price and nutritional value. Most of the cost of a feed is found in its energy and protein content. For this reason, these two elements generally are the starting point in building a feed. The amount of

(Turn to RENDERERS, page 142)

Ralph Van Hoven

Negotiations Fail for Sale of Feed Division

PORTLAND, ORE. — Negotiations for the purchase of the feed division of the Dairy Cooperative Assn. by the Washington Farmers Cooperative Assn. of Seattle have fallen through.

The Washington cooperative entered the Oregon broiler field nearly a year ago on an integration basis. It recently purchased the processing plant of the Northwest Poultry & Dairy Products Co. at Salem, Ore.

The dairy cooperative, up to about four years ago, had confined its feed manufacturing program to dairy feeds. However, in recent years the group has expanded into poultry feed manufacturing, and has no desire to sell at this time, officials said.

Thomas L. Daniels | John H. Daniels | Richard G. Brierley

ADM

(Continued from page 1)

eration of his family to head the company. His grandfather, John W. Daniels, founded the Daniels Linseed Co. which later became ADM. His father, the new board chairman, has headed the company since the death of Shreve M. Archer in 1947.

Thomas L. Daniels plans to remain active in the business, which has become highly diversified during his 11 years in the president's post. Mr. Brierley will be the company's first executive vice president since 1949.

The new president, 37, joined ADM in 1946 after military service. He served as flax buyer in Minneapolis for three years, as assistant sales manager of the packaged linseed oil department for two years and became assistant sales manager of the linseed oil division in 1951 and sales manager in 1953.

In 1955 John Daniels was elected a vice president of ADM and was placed in charge of production and procurement of the alfalfa division in 1956. The following year he was elected a vice president and director and was named manager of the formula feed division. He attended the advanced management program at Harvard University in 1957.

Thomas L. Daniels, 66, started his career with the company as a bookkeeper in 1914. In 1921 he entered the U.S. diplomatic service and returned to the firm in 1929, when he became a director and assistant treasurer. He was elected a vice president in 1933, executive vice president in 1946 and president in 1947. During a period in 1942-43 he served as chief of the fats and oils branch of the War Production Board.

Mr. Brierley, 43, joined ADM's soy flour department in 1942, was named sales manager of the department the next year and manager of the soy products division in 1945. He was elected an assistant vice president in 1948.

In 1952 Mr. Brierley became assistant to the manager of the alfalfa division, and he was placed in charge of production and procurement the following year. He was elected a vice president and manager of the alfalfa division in 1956 and was elected a director in 1957. Also, last year he was given responsibility for the ADM soy protein and soybean extraction operations at Evendale, Ohio.

He attended the advanced management program at Harvard in 1954 and served as assistant to the president of ADM in 1956. He recently completed a term on the executive committee.

ADM produces, in addition to flour, formula feeds and oilseed products, and a wide range of products in the chemical, oils and electronic fields.

Grain Fire Reported At Cargill Terminal

PORTLAND, ORE.—Portland firemen and Cargill, Inc., grain elevator employees this week tackled a fire in one of the steel grain storage tanks at Terminal No. 4. The fire threatened 770,000 bu. wheat, valued at more than $1,500,000 at current prices.

Burning grain was discovered in the storage tank when Cargill employees were making a routine inspection of the facilities. Large quantities of carbon tetrachloride fire extinguisher and some water were poured into the top of the big bin to smother the flames.

Arrangements have been made to empty the bin by drawing off the grain from the bottom by means of conveyor belts, pouring it into gondola cars and trucks for transport to idle coal bunkers and to a large parking area. Estimates are that it will take a week to move the grain, clean out the tank and stamp out all the fire.

The fire was attributed to grain packed tightly around an electric light bulb in the top of the big tank. Heat from the bulb was not permitted to flow away and apparently set fire to grain around it.

Cargill officials stated that this is the first time a fire of this nature has occurred in a large storage tank of the type built at Terminal No. 4.

The tank in which the blaze was discovered is one of the eight steel tanks erected in 1955 in a $4,300,000 program to increase the stored facility of the elevator to a total of 7,300,000 bu.

ADM Reveals Record First-Quarter Earnings

MINNEAPOLIS — Archer-Daniels-Midland Co., Minneapolis, has reported that its earnings for the three months ended Sept. 30 were the highest for the July-September quarter in six years.

Profits for the quarter were $1,618,181, equal to slightly more than $1.01 a share, compared with $1,149,418, or 71.5¢ a share, a year ago—a 41% gain.

Since the close of the previous fiscal year June 30, the company increased its working capital by $1,368,292, to $49,322,664, equal to $30.89 a share. Net worth rose $1,016,728, to $96,970,125, equal to $60.74 a share. The company's directors declared a dividend of 50¢ a share on ADM stock, payable Dec. 1 to stockholders of record Nov. 17.

Thomas L. Daniels, ADM president, said he is optimistic about business in the current year, "although there are soft spots in our economy."

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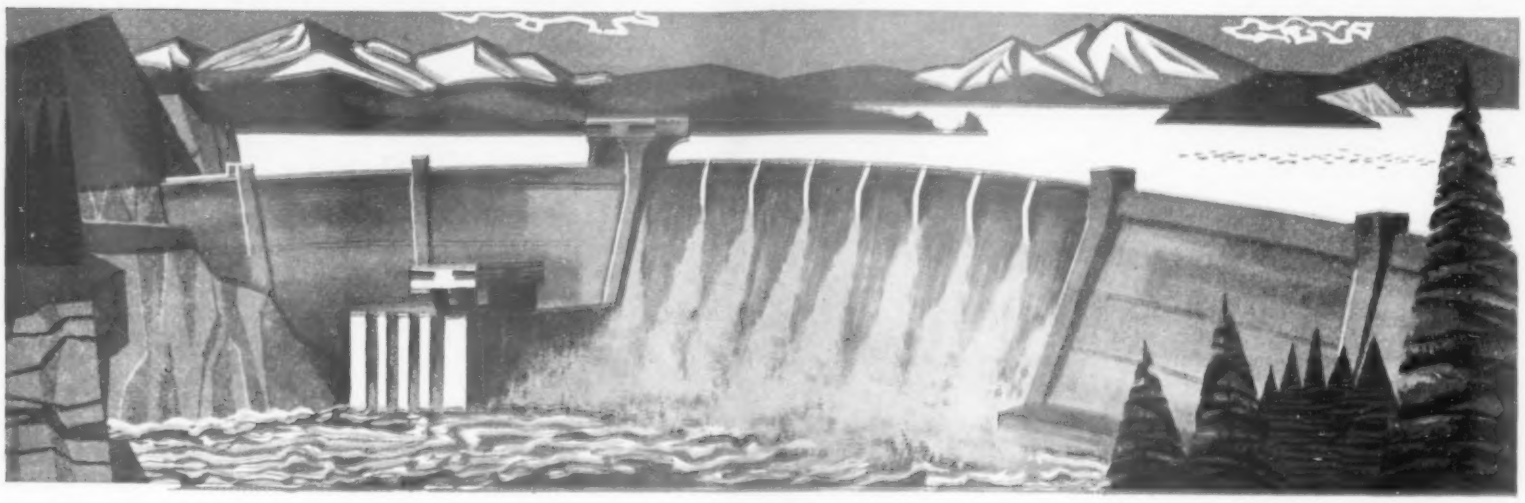

The planet we inhabit holds untold riches which creative man endows with utility and new value

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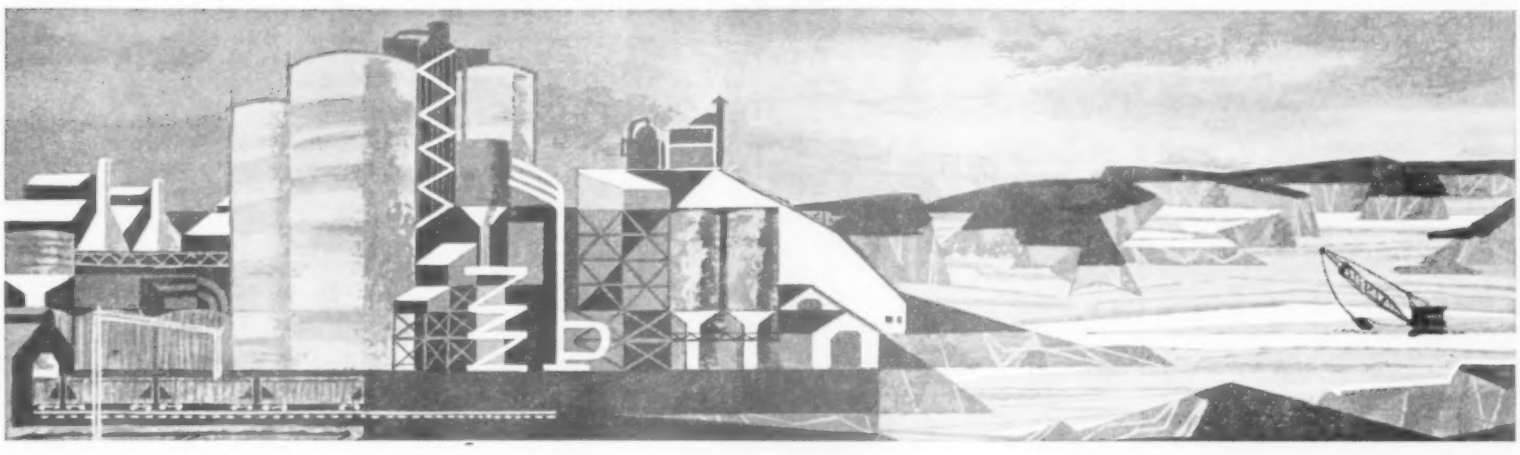

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sell at this time, officials said.

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SMALL'S DEHYDRATED ALFALFA MEAL

Iowa Farm Bureau Moves to Set Up Hog Marketing Plan

DES MOINES — The Iowa Farm Bureau Federation has taken steps to form an organization for the collective marketing of hogs.

The organization—articles of incorporation have been filed with the secretary of state's office—is called the Farm Bureau Marketing Assn. and is authorized to issue $1,125,000 in capital stock.

While the new corporation is authorized to buy, process and sell cattle, hogs, poultry and other farm products, Kenneth Thatcher, secretary of the Iowa Farm Bureau, said that for the foreseeable future at least, no definite plans have been made for expansion into areas other than hog marketing.

The hog marketing setup will be initiated with two collecting points in southeastern Iowa, where the heaviest concentration of hogs is located, Mr. Thatcher said, adding that there is a "definite probability" that one of the points will be at Washington, Iowa.

Besides locating the collecting points in areas of heavy hog concentrations, Mr. Thatcher said southeastern Iowa is favored because the plan now is to affiliate with the Illinois Livestock Marketing Assn. located at Decatur, Ill. The Illinois group includes 20 collecting points. The central association gives daily price quotations to the collecting points, and then consigns the livestock to buyers throughout the country where prices are most favorable.

Mr. Thatcher indicated that the Iowa organization would operate in much the same way, but pointed out that the plan in Iowa is in an initial, formative stage, and that Iowa hog producers are being contacted to determine what their marketing needs are. The program will then be developed on the basis of these needs.

Mr. Thatcher said that at present the plan is to issue stock in the new corporation only to those in the program, but he indicated that if extensive capital expansion comes about in the future, stock may be placed on the open market.

To Open Bids on N.C. Poultry Plant

RALEIGH, N. C. — Bids will be opened Nov. 18 for the construction of a major new poultry processing plant in Rose Hill, N.C. Operators will be Merritt Watson and Ebran and Jessie S. Watson.

The plant's main structure will provide 42,000 sq. ft. of floor space, including a large freezing room, a cooling room and work and storage areas.

Farmers Industrial Development Corp., an organization of poultry growers and others which is now being chartered, will award the construction contracts. The plant will be leased to the Rose Hill Poultry Corp., owned by the Watson interests, under a debt liquidation arrangement.

Reuben K. Salter Dies Following Heart Attack

CHATTANOOGA, TENN.—Reuben Kirkland Salter, 51, Chattanooga, vice president of Seed-Feed Supply Co. and former manager of the Standard Feed Milling Co., Hopkinsville, Ky., and Gainesville, Ga., died Nov. 2 of a heart attack.

Mr. Salter moved to Chattanooga three years ago to be associated with Harry A. Levin, president and owner of Seed-Feed Supply Co. in the operation of several businesses.

Surviving are his widow, a daughter, two sons and his mother.

Frank D. Allen

ADM Department to Represent Strong-Scott

MINNEAPOLIS — The equipment department of Archer-Daniels-Midland Co. has been appointed sales representative for the Strong-Scott Mfg. Co., Minneapolis, in the central and southern states. This was announced this week in a joint statement by R. R. Strong, executive vice president of Strong-Scott, and Richard G. Brierley, ADM vice president, Minneapolis.

The ADM equipment department, with headquarters in Kansas City, will handle the sale of Strong-Scott equipment in Nebraska, Kansas, Colorado, Oklahoma, Texas, Arkansas, Louisiana, Missouri and Mississippi.

Strong-Scott manufactures a complete line of mixing, grinding, separating and materials handling equipment for grain elevators, feed mills and processing plants.

The ADM equipment department is under the direction of Frank D. Allen, sales manager. Mr. Allen has been associated with the grain and feed mill machinery industry for many years. He will be assisted by Dean Scholes, sales engineer. Mr. Scholes previously was a sales representative for Strong-Scott, and prior to that he was a vice president of Agri-Tech, Inc., Kansas City.

Mr. Allen noted that the equipment department maintains a staff of engineers for design and layout service to its customers. This will be under the direction of Amos O. Russell. He formerly was with the engineering department of Columbian Steel Tank Co., where he designed feed mills and grain storage equipment. Mr. Russell is a former plant manager and assistant production manager for Cerophyl Laboratories, Lawrence, Kansas.

K. C. Feed Club Will Hear Athletic Director

KANSAS CITY — A program for sports-minded individuals is being planned by the Kansas City Feed Club for the Nov. 18 meeting. Bebe Lee, athletic director at Kansas State College, will be the speaker, discussing various aspects of college athletics.

To be held at the Wishbone Restaurant, the event will start with a social hour at 6 p.m. followed by dinner at 7.

Reservations may be made through Don Shay, Goffe & Carkener, Inc., 1147 Board of Trade Bldg., phone GR 1-5577, club secretary.

MOVES OFFICE

DES MOINES — Brummel Bros. Feed Mill, Leighton, Iowa, has moved its office quarters to the building formerly occupied by the Leighton postoffice. The rear of the building is now being used for added storage as is the feed firm's former office quarters.

Claims of Anti-Worm Action Now Permitted For Trithiadol

NEW YORK—Feed manufacturers are now permitted to state in advertising and on feed tags that Trithiadol is an adjunct in reducing the tapeworm and large roundworm burden in chickens, according to Robert S. Whiteside, president of Sterwin Chemicals, Inc., New York, manufacturer of Trithiadol.

He said the anti-worm action of the coccidiostat was established following extensive laboratory and field tests.

Noting that worms are a substantial economic problem to poultry raisers, Mr. Whiteside said that "test data showed that using Trithiadol in a worm controlling program proved to be a major aid in reducing the threat of these parasites."

Trithiadol was introduced nationally in 1957 and, according to the manufacturer, has been found capable of controlling all economically important species of coccidia under field conditions. In addition, Sterwin says, it has been demonstrated that Trithiadol medicated feed helps produce optimum market grade chickens with "superior" weight and feed conversions.

GTA Drops Star-Hi, McCabe Feeds Brand

ST. PAUL, MINN.—Star-Hi Feeds, brand name of the McCabe Co., Minneapolis feed and grain firm which became the property of the Farmers Union Grain Terminal Assn., St. Paul, Oct. 1, are now under a new name.

The GTA has announced that the brand will henceforth be called GTA Feeds.

"There will be no change in these important factors: same formulas, same high quality, same fair prices, same top service and same close location of mills plus mills at Great Falls, Billings and Chinook, Mont., and Williston and Minot, N.D.," the announcement said.

The five mills mentioned are a part of the Farmers Union Grain & Supply Co., a part of GTA. McCabe feed mills added to GTA by the transaction are located in Montevideo and Perham, Minn.; Hunter, N.D., and Glendive, Mont., "plus many grinding stations situated strategically in four states."

The McCabe Co. has operated in Montana, Minnesota and North and South Dakota since 1886. It had 22 elevators and feed plants in Montana, 15 elevators and feed plants in North Dakota, 16 in Minnesota and four in South Dakota.

T. C. Croll, GTA line manager, said these additions bring the number of GTA line houses to 205, with a total capacity of better than 20 million bushels. GTA also has terminal space of slightly under 30 million bushels and affiliated farmer cooperative capacity of some 45 million bushels.

Seeks Okay on Santoquin Under New FDA Law

WASHINGTON—The first petition for a safety tolerance under the recently enacted food additives law is for a chemical to be used in feed, the Food and Drug Administration announced this week. (The additive law applies to livestock and poultry feeds as well as foods.)

FDA published in the Nov. 5 Federal Register a petition by Monsanto Chemical Co., St. Louis, for use of an antioxidant—1,2 dihydro-6-ethoxy-2, 2,4-trimethylquinoline (Santoquin). FDA said the chemical would be used to treat 16 major forage crops, including alfalfa, in the process by which they are commercially dehydrated for sale to feed manufacturers.

Purpose of the treatment would be to protect the dehydrated forage from loss of nutrients (carotenes, xanthophylls, and vitamins E and K) by oxidation destruction. The petitioner requests a tolerance (amount of the chemical that may safely be allowed to remain in or on the dehydrated crops) of 150 parts per million.

The company's petition, FDA explained, is the first formal step that is required to obtain approval of its proposed use of the chemical additive. The petition was officially filed by FDA on Oct. 14. Within 90 days after filing date, FDA will publish a proposed regulation accepting, modifying or rejecting the petition. Any person adversely affected by the proposed regulation has 30 days to file objections and request a public hearing, FDA says.

The current petition for use of Santoquin under the new additive amendment to the FDA law substitutes for previous submission of data to FDA under already existing regulations. The alfalfa dehydrating industry has been interested in obtaining FDA clearance for use of Santoquin in dehydrated alfalfa.

PL 480 Agreement With Israel Includes Feed Grain Order

WASHINGTON—The U.S. Department of Agriculture announced an agreement between the U.S. and Israel providing for financing purchase of $37,742,000 worth of U.S. agricultural products under Title I of Public Law 480.

The purchase includes approximately 350,000 metric tons of feed grains for $15,355,000, about 180,000 metric tons of wheat for $11,256,000, 8,000 metric tons of vegetable oils at $2,381,000 and 7,000 metric tons of nonfat dried milk at $1,528,000. Beans, cotton and tobacco make up the remainder of the purchase.

Sales will be made by private U.S. traders.

Ezra Taft Benson, secretary of agriculture, commented this week that in spite of the delay in extending PL 480 until Aug. 22, the processing of requests and negotiation of agreements have proceeded rapidly. Mr. Benson had asked Congress to extend the legislation before June 30 to speed up operations.

"We expect that Title I commodity agreements will continue to be negotiated more rapidly this year than in any previous year," Mr. Benson said.

Houston Feed Club Schedules Meeting

HOUSTON — The Houston Feed Club will meet at noon Nov. 11 in the Ben Milam Hotel. William N. Blanton, commissioner for the Port of Houston, will tell of the importance of the Port of Houston to Texas.

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
Administrative Center: Skokie, Illinois

National Egg Council Elects Officers, Adopts Set of By-Laws

KANSAS CITY, MO.—A board of directors of five members met here in October to adopt a set of by-laws for the newly organized National Egg Council and to elect officers.

Vern Steckley, Kendallville, Ind., hatcheryman, feed man and flockowner, was named president. First vice president is Ray Parmenter, breeder of Rhode Island Reds, Franklin, Mass., and second vice president is Miller Manford, Nixon, Texas. O. H. Green, Spartanburg, S.C., hatcheryman and flockowner, was named treasurer, and Don M. Turnbull, Kansas City, Mo., was named secretary.

The officer slate duplicates that of the American Poultry & Hutchery Federation, the agency which has been instrumental in launching the National Egg Council and which is putting up $5,000 for its first year of operation.

Schedule of Dues

The board also agreed on a schedule of dues and established three classes of membership. They are:

• Active Members—Persons, firms, partnerships, corporations, cooperatives or marketing associations engaged in the production or marketing of eggs. Dues for producers are based on the number of birds owned as follows: Up to 5,000 birds, $5; between 5,000 and 20,000 birds, $10; between 20,000 and 50,000, $25, and over 50,000 birds, $50.

Dues for cooperatives and marketing associations are based on the number of cases handled annually as follows: Up to 25,000 cases, $25; between 25,000 and 50,000 cases, $50; between 50,000 and 75,000 cases, $75, and over 75,000 cases, $100.

• Associate Members—Persons, firms, partnerships, corporations, cooperatives or marketing associations interested in the production and marketing of eggs but not qualifying as "active" members. Associate dues are $25 annually.

• Honorary Members.

Model articles of incorporation and recommended by-laws for state affiliate chapters have been distributed to potential state affiliate groups in a number of states.

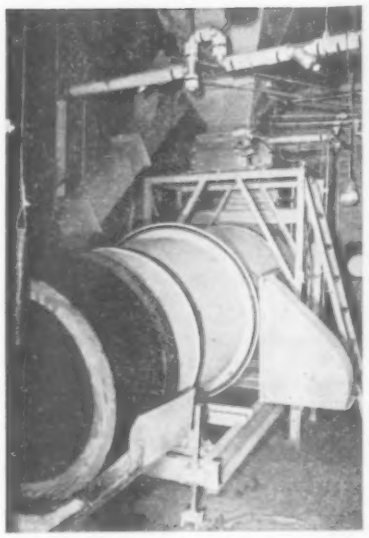
Kent Feeds Announces Turkey Growing Plan For Iowa Producers

MUSCATINE, IOWA—Kent Feeds, Inc., in cooperation with Albrecht and Yoder Hatcheries, has made available an associated growing agreement to selected quality turkey producers of Iowa, Kent officials announced this week. "Growers who meet specified management conditions," the company said, "can take advantage of this plan, which embodies the following policies:

"Albrecht's Hatchery, located at Cedar Falls and Greene, and Yoder's Hatchery, Wayland, have contracted to custom hatch eggs for Kent Feeds. The grower purchases poults from one of these hatcheries at the prevailing price at the time of purchase, with Kent Feeds guaranteeing 100% livability at the end of 10 days.

"Kent Feeds agrees to pool all profits from the sale of poults in excess of their actual cost and distribute these profits among the members of the association in relation to the number of poults each grower has purchased. The grower, to receive this refund, must follow the Kent feeding and management program. This plan has as its primary objective the advantage of thus allowing the producer to buy his poults at their actual wholesale cost."

Kent territory specialists have been given full details of this plan to present to interested growers.



Pictured here is an installation in an eastern feed plant of a Sprout-Waldron fat addition system for pellets. The retention drum is in the foreground. The system is described in the accompanying story.

Sprout-Waldron Outlines System for Adding Fat to Pellets

MUNCY, PA.—Sprout, Waldron & Co., Inc., has announced the details of a new system for adding fat to pellets.

The trend, Sprout-Waldron engineers note, is in the direction of adding fats after pelleting, which is described as the most satisfactory procedure.

The company's system "accurately controls the addition and even distribution of up to 10% fat to pellets at rates ranging from 4,300 to 60,000 lb. per hour," the announcement said.

There are actually two basic systems—"on stream" (OS) and "on bin" (OB). Each is available in a low capacity design, with a range of 4,300 to 30,000 lb. per hour, and a high capacity design, with a range of 8,600 to 60,000 lb. per hour. When it is possible to install a bin above the fat addition system or near enough to use a method of feeding (screw conveyor, belt feeder, etc.) or when a new mill is designed, the OB system is recommended. This is simpler and somewhat less expensive than the OS system. Where the system has to receive a direct discharge from the pellet cooler and grading shoe, the OS system is used.

All systems have certain basic components in common — including the retention drum and drive mounted on an adjustable pitch base; an angle iron supporting frame, and the fabricated cascade spout containing the fat spray manifold. Both systems have a feeding device, a pump, con-

(Turn to PELLETS, page 144)

New Hampshire Group Approves Egg Merger

DERRY, N.H. — Members of the New Hampshire Egg Producers Cooperative gave unanimous approval to the principle of merging their organization and other New England egg marketing cooperatives with the Eastern States Farmers Exchange of West Springfield, Mass., at the 24th annual meeting of the NHEPC at plant headquarters here.

The proposal calls for a new marketing division to be created within the Eastern States organization, which operates in a nine-state area, including all of New England.

The ESFE, with more than 100,000 members and sales approximating $85 million last year, is a farmers' purchasing cooperative, operating basically in feeds, fertilizers and farm supplies.

The New Hampshire cooperative had a sales volume of $2,372,441 during the past year, it was reported by Manager Harold Ek.

USDA REPORT ON CUSTOM MILLING NOW AVAILABLE

WASHINGTON—A new U.S. Department of Agriculture report on costs and charges in custom feed mills is now available. The report is based on a study of custom feed milling in the Midwest. A preliminary report covered cost standards for a model custom feed mill. (This preliminary report appeared in Feedstuffs, Dec. 7, 1957.) The new report includes much of the earlier report plus additional information. A plant layout and flow pattern for a custom mill are part of the report. Costs and charges also are analyzed. USDA says custom mill managers can use this analysis as a standard of comparison to estimate their own cost and income situations. Some information on mobile mills is included, too. A free copy of the new report—"Custom Feed Milling in the Midwest," Marketing Research Report No. 273—may be obtained from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

Two Named to Posts By Engineering Firm

KANSAS CITY — Charles A. Redman has been named chief engineer and William L. Wills, general construction superintendent of Timmons & Evans Co., Kansas City engineering firm, according to an announcement by W. A. Timmons, Jr., president.

Mr. Redman, a graduate of the University of Kansas, has had several years of experience in structural design, both concrete and structural steel, and he is a registered professional engineer. He was with Nelson, Beggs & Eidson Consulting Engineers for several years and later formed a partnership with Tom Beggs. This firm did most of its work for contractors engaged in construction for the feed and grain trades.

Mr. Wills has spent several years as general construction foreman for Jack & McCord Construction Co. The announcement said he is experienced with slip form concrete construction and equipment installation in the feed and grain trades.

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FALCON BRAND PULVERIZED WHITE OATS
STANDARD BRAND PULVERIZED WHITE OATS
DAIRY BRAND COARSE GROUND OATS
CRESCENT BRAND PULVERIZED OATS
CORN OATS PELLETS (Corn-Oats)
MIXERS' PULVERIZED OATS
MIXERS' COARSE GROUND WHITE OATS
MIXERS' PELLETED OATS
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OAT FEED
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Ivan Miller Heads Illinois Feed Men; Egg Group Formed

By DON E. ROGERS
Feedstuffs Staff

SPRINGFIELD, ILL.—Ivan Miller, Crawford County Farmers Exchange, Robinson, was elected president of the Illinois Feed Assn. at the annual convention held jointly with the Illinois Poultry Improvement Assn. in the Springfield Armory Nov. 5-6. He succeeds Alvin Lovekamp, U&L Grain Co., New Berlin.

Dan Teefey, Teefey Feed Co., Mt. Sterling, was chosen vice president and Robert Pevahouse, Archer-Daniels-Midland Co., Springfield, was elected treasurer. Dean M. Clark, Chicago, was reappointed executive secretary.

New directors elected for three-year terms are Herbert Woolsey, Woolsey Farm Service, Vandalia; Carl Rylander, Kauffman Feed Mill, Waterman, and Mr. Pevahouse.

Well over 800 delegates and guests registered for the convention and the product and equipment show in the armory. Further details of the meeting will appear in Feedstuffs next week.

A new name for the Illinois Poultry Improvement Assn. was voted by delegates to the convention. The group will now be known as the Illinois Poultry & Hatchery Federation, according to Aubrey Harless, Shelbyville, executive secretary-treasurer.

Henry Marlowe, Marlowe Hatchery, Huntley, was elected president. Stanley Taylor, Standard Hatchery, Decatur, was chosen first vice president and Ben Ward, Wards Hatchery, Geneseo, second vice president.

The delegates voted to organize a new group to be known as the Illinois Egg Council. By-laws were approved and authorization was approved to file a charter. The council will be made up of egg producers and all segments of the egg marketing and distributing industry. It will be affiliated with the National Egg Council. Its purpose will be to represent and assist egg producers in the promotion of eggs in every manner possible.

Oilseed Meal Futures Prices Climb Sharply

MEMPHIS—Oilseed meal futures moved up rather sharply during the past week as the result of improved cash meal business and speculative interest, based on slightly lower soybean oil at the end of the period.

Better speculative demand found offerings light in futures, giving the market a boost.

Weather conditions made it more favorable for the use of mixed feed, creating firmer demand for the cash article.

Unrestricted soybean oil meal closed Nov. 5 75¢ to $1.90 ton higher than on Oct. 29, Eastern Trunk Line soybean oil meal was $1.40 to $1.90 higher, bulk solvent cottonseed oil meal 50¢ to $1.25 higher, and sacked old process cottonseed oil meal $1.25 to $2.25 higher.

Dealings for the period amounted to 7,000 tons of unrestricted soybean oil meal and 200 tons of bulk solvent cottonseed meal, with the market closed for Election Day.

Cincinnati Meeting Set

CINCINNATI — "Managing Credit in Today's Market" will be the subject of a talk by W. B. Behrens, secretary-treasurer of the Randall Co., manufacturer of automobile supplies, at a monthly dinner meeting of the Cincinnati Feed Club Nov. 10 at Stein's Hideaway Restaurant. A cocktail hour will precede the dinner at 7 p.m.

PRICES

(Continued from page 1)

winter may average near last year's level, but probably will not advance as sharply next spring and summer as the 20% rise from January to June in 1958.

Better Feed Quality

Although the corn crop this year is larger than a year earlier, it is of better quality and prices will not be depressed this winter as they were last year by large marketings of high moisture corn from the 1957 harvest, the report said.

The seasonal pattern in corn prices this fall is also expected to be nearer to normal than it was a year ago when the prices made little recovery from the seasonal low until after February. In postwar years, corn prices have usually reached a seasonal low in November, but usually recovered fairly rapidly in December and January, after which they have advanced more slowly.

Oats prices were lower last summer than a year earlier and they are expected to average a little lower for the 1958-59 season. Barley prices in the important midwestern states have been about the same as a year earlier while they were a little higher than a year earlier in West Coast states where production this year is smaller.

Sorghum grain prices have declined sharply this fall. The average prices received by farmers dropped from $1.82 cwt. in July to $1.57 in October. The mid-October price, however, was 14¢ higher than a year earlier, but 26¢ under the 1958 national average support of $1.83 cwt. Better quality of this year's sorghum and barley crops appears to be the major factor in maintaining prices above a year earlier. Sorghum grain prices usually reach a seasonal low in November and advance during the harvesting season. A similar pattern seems probable this year, according to the report.

Formula Feed Influence

Price increases among the high protein feeds during the past year have been the greatest for soybean meal and animal protein. While prices of these feeds are influenced to quite an extent by the general forces that affect the price of feed grains, they also derive strength from the demand for their use in formula feeds, the report said. Demand for most types of prepared feeds during 1958 has been good. Added to this, smaller production of tankage and meat scraps gave added strength to prices of these feeds and they rose to the highest levels since 1952. Favorable levels of livestock prices with above-average livestock-feed price ratios also have supported demand for prepared feeds and in turn high-protein feeds in 1958.

Expected increases in livestock and poultry production will help to maintain protein feed prices during the coming year. But larger supplies of soybean meal and animal proteins are in prospect and prices of livestock and livestock products are expected to average somewhat lower. These forces are expected to result in prices of soybean meal and animal proteins averaging a little below the 1957-58 levels, although they may continue in stronger demand, relative to supplies, than feed grains.

Prices of lower protein feeds such as wheat millfeeds, hominy feed and oat millfeeds, because of their similarity to grains, will continue to be influenced by the level of feed grain prices, the report said.

Alfalfa meal has been in special demand during the past several years because of its high vitamin A content, but alfalfa meal prices this past summer averaged substantially lower than a year earlier. This reflects in part the favorable growing season and larger supplies of alfalfa meal, the report said. Another factor seen as resulting in weaker alfalfa meal prices may be the trend toward lower fiber content in poultry feeds.

Livestock numbers to be fed during 1958-59, in terms of grain consuming animal units, are expected to be about 6% above the 162 million fed in 1957-58. Much of the increase is expected to be in hogs, but cattle feeding is expected to be up during 1958-59 and dairy cows are expected to be fed record quantities of grain and other concentrates. Increased laying hen numbers and a further increase in broilers are also in prospect.

Reporting on the outlook for livestock-feed price ratios, the USDA said the hog-corn ratio is expected to decline from its high level of the past feeding year, but to continue above the 1947-56 average of 13.2. The beef steer-corn ratio is also expected to continue above average during the coming year as are the milk-feed and butterfat-feed ratios.

EQUIPMENT OPEN HOUSE PLANNED

KANSAS CITY — The Midwest Feed Manufacturers Assn. this week called attention to the large amount of machinery and equipment which will be used in demonstrations at the Feed Production School being held Nov. 12-14 at the American Royal Bldg. in Kansas City. Nearly 50 firms will have bulk handling, custom milling and other equipment at the school. It was pointed out that the machinery used in the demonstrations will remain in the American Royal Bldg. on Saturday, Nov. 15 for feed men, including both school enrollees and others, to view and inspect. The association said that those who are unable to attend the school are invited to visit the American Royal Bldg. on Nov. 15. Meanwhile, a large attendance representing a wide area, including most parts of the U.S. and a number of foreign countries, is expected at the school.

Monsanto Describes 'Growth Spurt' Concept At Arkansas Seminar

FAYETTEVILLE, ARK. — Broiler feed manufacturers and nutritionists in the Arkansas area were guests of Monsanto Chemical Co. at its second animal nutrition seminar.

The seminar was held Oct. 21 at the Mountain Hill Hotel, with current Monsanto research activities in nutrition being discussed. Representing the company were Dr. G. Lynn Romoser, A. D. Evans, H. W. Andway and W. J. Becher II.

During the seminar, Dr. Romoser described Monsanto's new "growth spurt" concept of broiler feed formulation. Extensive research by the company, he said, has demonstrated that substantially improved growth rate and feed conversion can be obtained by feeding broilers a high energy finishing ration after the fifth week. A lower energy ration containing the same level of protein is fed during the first five weeks. A partial restriction of dietary energy during the first five weeks, he added, actually results in a better growth rate and feed conversion from the high energy finishing ration than is obtained if the high energy ration is fed throughout.

"Despite the slightly higher cost of the 'growth spurt' finishing diet," Dr. Romoser continued, "the improved feed efficiency during the finishing combines with the reduced cost of the starting ration to effect a meaningful saving per market weight bird."

Monsanto officials noted that the seminar here was the second of a series. The first one was held previously at Salisbury, Md. Subsequent seminars, they said, are contemplated for Texas, North Carolina and other broiler areas.

Further Improvement Reported in Broiler Prices in Delmarva

SALISBURY, MD.—Broiler prices, going against predictions, are coming up in price instead of going down. After several weeks of slumping prices, the prices are improving. Last week the average Delmarva price paid on the farm was 16.8¢ lb. A week earlier the price was 16.2¢. A year ago the price was 16.7¢.

Delmarva growers received a better price last week than a year ago in spite of the fact that 14% more birds were marketed. According to the Maryland-Delaware Crop Reporting Service, local growers sent 3,458,000 birds to market last week. This was 15% less than the previous week.

Nationwide last week, hatcherymen in 22 reporting states set 38,544,000 eggs. This was 2% more than the previous week and 15% above the corresponding week a year ago. Increases in the number of eggs set from the previous week were reported in 13 of the 22 states. Sharpest increases from the previous week occurred in Indiana, Georgia, Arkansas and Delaware.

Hatcherymen in the 22 states moved 26,731,000 broiler chicks to the farm last week. This was 4% more than the previous week and 16% above the corresponding week a year ago. Increases were reported for 16 states—decreases in six states, compared to the previous week. Largest increases from the previous week occurred in Alabama, Texas, Pennsylvania and Delaware.

RESEARCH

(Continued from page 1)

The farm is the property of Illinois Farm Supply Co., but the research and feed test evaluation work will be a combined program in the interests of the sponsoring organizations.

Research projects on the farm will involve practical tests of feed formula improvements which appear to hold promise for more efficient livestock production, a spokesman said. The work will not involve basic research as such; the sponsoring cooperatives will continue to depend mainly upon the colleges of agriculture for basic research.

Remodeling Plans

Planning is now underway for the buildings and equipment needed for the work. This includes improving present buildings, construction of others, and the installation of equipment including the livestock watering system. Water will be piped also to pastures for feeding test work.

Feeding and test evaluation programs, with confinement feeding of hogs, will require the use of two new buildings, each 42x130 ft. A total of 144 litters of hogs will be raised and fed out in the confinement phase during the year. In addition, work will be continued in evaluating feeds for swine on pasture.

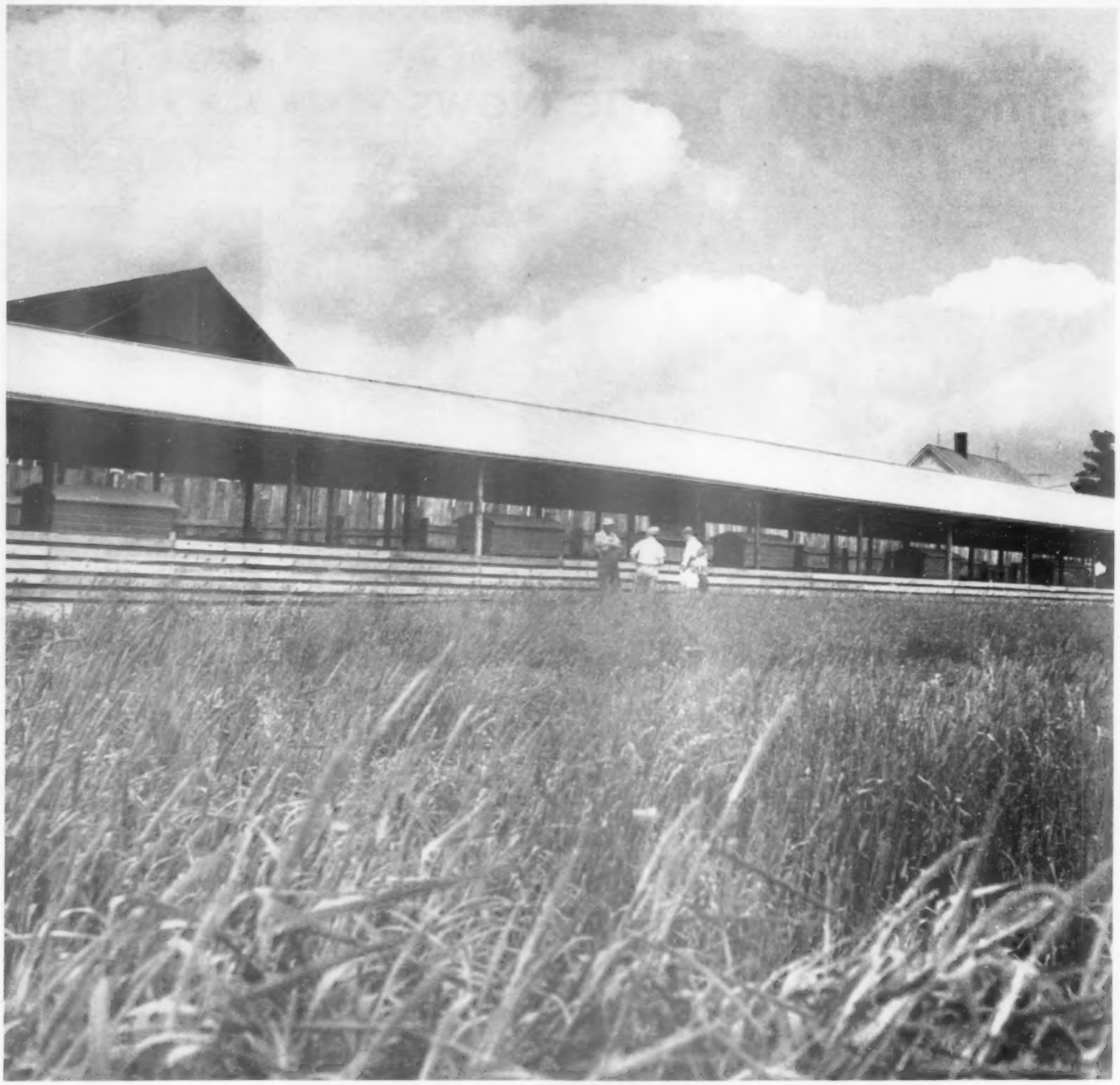
A cattle shed 50x136 ft. will be constructed. This will provide for the feeding out of 120 head of cattle on test.

For several years, most of the members of this group of cooperative feed manufacturers have been engaged in research and feed evaluation test work in the areas of broiler, turkey and laying feeds. These combined programs have been conducted on research farms located in Delaware, Virginia and North Carolina.

After the newly-acquired Illinois farm is in operation, demonstrations of various feeding programs will be held for farmers.

CLAUDE T. GRAVES DIES

GUTHRIE, KY. — Claude Talley Graves, 53, a former grain, feed and livestock dealer at Guthrie and Clarksville, Tenn., died Nov. 4 following a long illness.



"Pig Parlor"... the modern way of raising market hogs

Helping feed dealers keep in step with changing times

"If you were to return to the farm today, after a ten-year absence, you'd have to learn farming all over again."

If that is an exaggeration, it's a slight one. Farming is marching forward more rapidly than any major industry. To serve an agriculture that has new ways to raise poultry and livestock, feed dealers must keep in step with changing times.

Purina keeps an experienced eye on new practices in agriculture and sorts the practical from the fads. Purina Research tests new methods and develops products for best performance under changed conditions.

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Camera Views of the News ★ ★ ★ ★ ★ ★

TO ATTEND PRODUCTION SCHOOL—This group of animal nutrition majors at Colorado State University, Ft. Collins—the entire class enrolled in feed technology —will entrain Nov. 11 for Kansas City. There the students will be among the persons on hand for the three-day Feed Production School, being held Nov. 12-14 under the sponsorship of the Midwest Feed Manufacturers Assn. In the picture, from left to right, are:

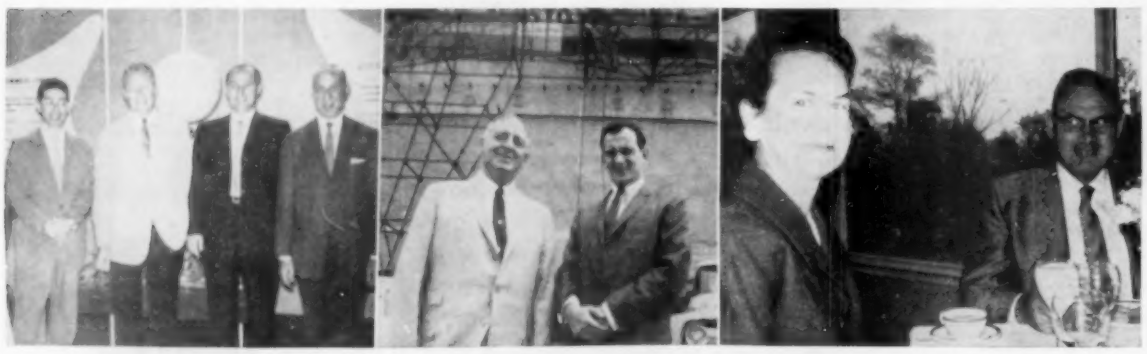
Front row: Alan Nadelson, Brooklyn, N.Y.; Leroy Thomas, Fleming, Colo.; Clyde Vair, Arvada, Colo.; Frederic Campbell, Greenville, N.M.; Stanley Leon Hannah, Boulder, Colo.

Middle row: Robert Maurice Scriven, Gering, Neb.; Leonard McKinster, Denver; Charles Carlson, Colorado Springs, Colo.; Gary Brown, St. Johns, Ariz.; Dale Aden, Dayton, Pa.; Hershel Goar, Clovis, N.M.; Richard Collin, Montrose, Colo.; Winston Parker, Pueblo, Colo.

Back row: William Kochis, Matheson, Colo.; Donald L. Figurski, Salida, Colo.; Herbert Jordan, Pueblo, Colo.; Richard Bull, Cedaredge, Colo.; Leon L. Hopkins, Jr.; Colorado Agricultural Experiment Station, Ft. Collins, Colo.; Carl Burtis, Jr., Montrose, Colo.; Jack Winter, Windsor, Colo.; Kenneth Lehr, Ft. Collins, Colo., and Dr. L. E. Washburn, instructor of the class and in charge of animal nutrition teaching and research at Colorado State Univ.

BERMUDA SHORTS, OF COURSE —Because he won the Prater Pulverizer Co. "Spelling Bee," Roland Nelson and his Mrs. spent eight sunny days at the Castle Harbour Hotel in Bermuda. Mr. and Mrs. Nelson dressed according to custom of course. Mr. Nelson, from Plainfield, Ill., represents Prater in northern Illinois. Included in the couple's itinerary were deep sea fishing, swimming, a motor bike tour of the island and plenty of "good old Illinois relaxing." Other winners in the Chicago firm's contest were Ed Wadington, eastern Iowa representative, and Harold Attebery, Ken Fishbaugh and Harry Duffy, Ohio representatives.

ALABAMA CONFERENCE—Discussing the program at the recent Alabama Nutrition Conference, in the first picture above are, left to right, Royce Wood, Decatur, president of the Alabama Feed Assn.; W. L. Walsh, Montgomery, secretary-treasurer of the Alabama Poultry Industry Assn., and Brice Johnson, Birmingham, secretary-treasurer of the feed group. The conference, held at Alabama Polytechnic Institute at Auburn, was sponsored by the feed association and API. In the second photo are some of the industry men who attended the conference. Left to right are: Harold Metzner, Amburgo Co., Charlotte, N.C.; Lou Dye, Nopco Chemical Co., Charlotte, N.C.; Merlin Bryant, Brundidge (Ala.) Milling Co., Brundidge, Ala.; Bill Cook, Ralston Purina Co., Guntersville, and Bill Evans, National Alfalfa Dehydrating & Milling Co., Sinking Springs, Pa.



AT MEXICO CITY—Personalities photographed at the recent 11th World's Poultry Congress at Mexico City include four representatives of the Nopco Chemical Co., Newark, N.J., shown in the first picture. They are (left to right): Jack Rovicks, nutrition department; Hal Swanson, vice president; Dr. Mel Hochberg, vice president, and Joseph Goldstein, export manager. In the second picture are: Adolph Rosenberg, president of Stabilized Vitamins, Inc., Garfield, N.J., and his son, Ralph, also of Stabilized Vitamins. In the third picture, taken at Mexico's Hotel Del Prado, are Mr. and Mrs. Ralph Cleveland. Mr. Cleveland is owner of the Gainesville (Ga.) Milling Co. (These pictures were taken by Samuel M. Golden, Amburgo Co., Inc., Philadelphia.)

EGG BREAK — Susan Treat of Orange, Conn., takes time out from her duties as "Miss Eggtober" to enjoy a snack. Since midsummer Susan has shown thousands of visitors at fairs and poultry trade shows this easy way to peel a hard-boiled egg: Apply plastic tape around center of egg, crack shell along path of tape, rip off tape. Both ends of shell slip off. Agricultural division of Chas. Pfizer & Co., Inc., originated Eggtober theme to promote both consumption and production of eggs.

Southern Egg Production Reaching U.S. Average, Tennessee Poultrymen Told

NASHVILLE, TENN.—About 135 persons, representing all segments of the poultry industry, attended the sixth annual convention of the Tennessee Poultry & Egg Federation here recently.

Leading off the speakers' section was Dr. Kenneth Laurent, advisor to the Poultry Survey Committee, who said that the egg production per hen in the South was rapidly approaching the national average.

"The total number of eggs produced in the U.S. has not increased, but the production per hen has advanced rapidly in the past 10 years," he said.

According to Dr. Laurent, this year will be recorded as one of the most successful advertising years on broiler promotion.

Emphasizing the law of supply and demand and its effect upon price, Dr. Laurent reminded the group that six months ago the survey committee forecast 15¢ broilers. Tying in the prediction for lower hog prices, he felt that competition between broilers and pork will tend to hold the price of broilers at a low level. To remedy this situation he suggested a reduction in production similar to the 10% decrease in turkey production this year.

Dr. J. H. Hare, Chas. Pfizer & Co., Inc., discussed poultry health products. He said that absorption of antibiotics such as Aureomycin and Terramycin could almost be doubled by reducing the amount of calcium in the diet. The use of oxolic acid, he stated, precipitated calcium in the digestive tract which permitted a greater uptake of the antibiotics. The use of terephthalic acid, which has not been approved as a feed ingredient by the Food and Drug Administration, increased the absorption and retention of antibiotics in the bloodstream about four times, he said.

Dr. Hare pointed out that a combination of terephthalic acid with an antibiotic made it possible to more effectively combat synovitis.

Reviewing contract farming as used by the Tennessee Egg Co., Chattanooga, was W. B. King. He stated that his firm owned some 200,000 hens and farmers supplied the labor, housing and all equipment needed by the birds. The company supplies the chicks, feed, medicines and collects eggs each day from the producer.

As of January, 1959, he said, a new contract will be in effect which will give a base of 4¢ per doz. Incentives or bonuses based upon mortality, feed consumption and egg production will make it possible for the producer to earn a maximum of 10¢ per dozen eggs.

"The major problem encountered is the number of cracked and dirty eggs," he said.

Dr. H. V. Shirley, University of Tennessee poultry department, said that environment was a major factor in the performance of hens as the heritability of the several economic factors involved in egg production was relatively low.

Reviewing experiments at the university, Dr. Shirley said that pullets grown on 14 hours of light per day with added increments of light used after 10 months of age gave the greatest production of any treatment used. He stated that six hours of light throughout the growing and production period was insufficient to secure satisfactory egg production. He added that it appeared that pullets need not be grown under conditions of restricted lighting if the increments of light were increased at regular intervals after the birds were 10 or 11 months old.

Mandatory inspection will assist the industry in producing better chickens, said Harold Ford, Southeastern Poultry & Egg Assn. He stated that an over-all increase in costs of about 2¢ per pound would be experienced and that from 5 to 15% of the broilers would be placed in lower grades due to bruising, poor feathering, breast blisters, broken bones, torn skin and poor bleeding.

Gordon Sawyer of the National Broiler Council emphasized that buyer and seller pressures reflected in the price of eggs and broilers. He stressed the importance of advertising and the desirability of promoting "Bro-Hens."

Another speaker, Curtis Collier, southern branch of the Poultry & Egg National Board, recounted information secured from surveys conducted with housewives. He said that the acceptance of chicken and eggs by homemakers under 30 was reflected in the attitudes of their mothers. Young housewives associated eggs with good food for children. The older ladies associated eggs with breakfast. Over 80% of the women interviewed considered eggs high in protein, as a basic food and as an economical food.

Dr. J. K. Bletner, University of Tennessee poultry department, said producers and feed manufacturers should carefully study ingredients necessary to produce broilers with the greatest efficiency.

He said that the University of Tennessee tests indicated that insoluble granite was not necessary in broiler feeding.

Dr. Bletner reported that milo could replace approximately 50% of the yellow corn in broiler rations without materially affecting growth. Alfalfa meal, corn gluten meal and vitamin A were recommended in rations containing milo.

Work at the school showed, Dr. Bletner said, that a laying ration containing 17% protein plus 6% added fat was the most efficient of those tried for leghorn hens.

Preliminary data showed that a ration high in energy and containing 25% protein cost 80¢ more per 100 lb. than a ration containing 22% protein. The low protein diet produced chicks weighing less than a high energy protein diet, but the feed cost per pound of live broiler was essentially the same, Dr. Bletner said.

At the group's business meeting, M. V. Williams, Friendship, Tenn., was elected president.

Other officers elected included: Fred Pinckard, Chattanooga, first vice president; Henry Tilford, Jr., Shelbyville, second vice president, and O. E. Goff, Knoxville, secretary-treasurer.

New board members elected were: W. T. Howington, Memphis; Ben Harrison, Knoxville; Don Grubbs, Greenbrier, and Hal McGeorge, Memphis.

The board selected Nashville as the site for the 1959 meeting.

TOP ANGUS PRODUCER

ST. JOSEPH, MO.—Missouri led all other states and territories in the production of registered Angus cattle in 1958 followed by Iowa and Illinois, according to Frank Richards, secretary, American Angus Assn., St. Joseph. Ranking fourth is Texas. Its neighbor, Oklahoma, advanced to fifth position.

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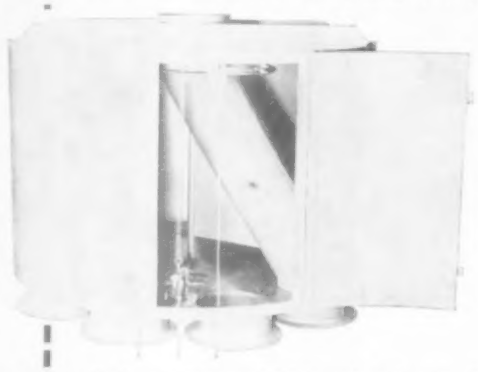

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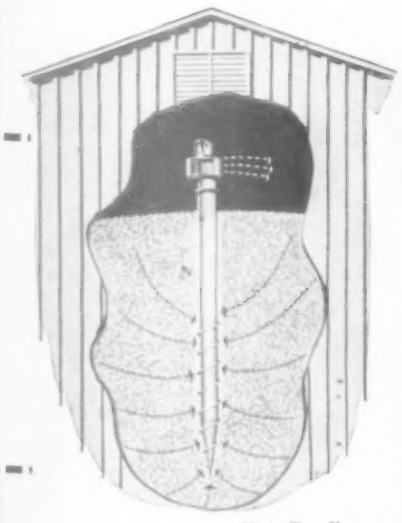

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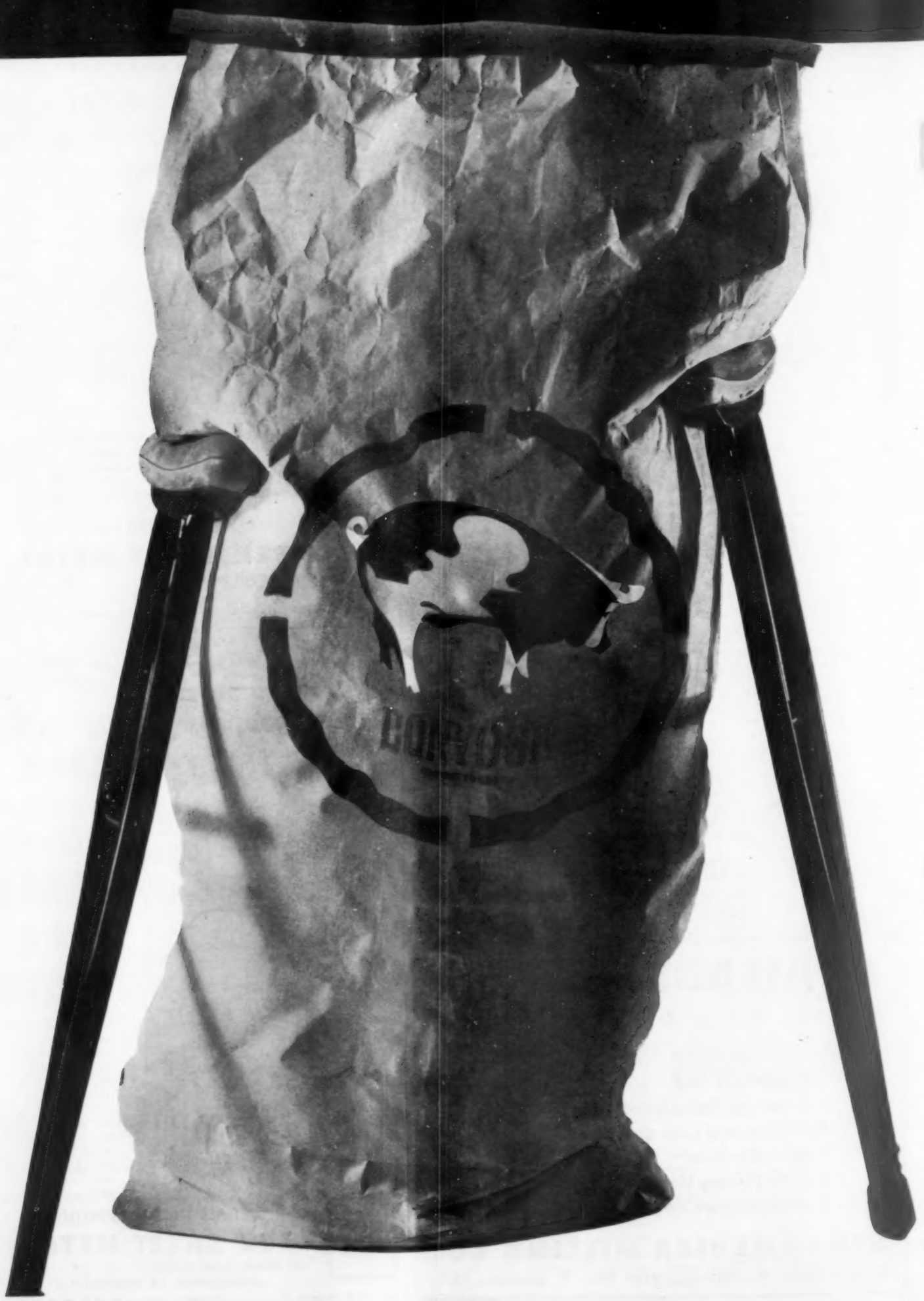

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1. McGinnis, J. et al.: Use-history of Antibiotics as Related to Their Efficacy in Promoting Growth of Turkeys. Poultry Science, in press.
2. Slinger, S. J.: Poultry Nutrition in Focus in a Rapidly Advancing Industry. Feed Bag, July, 1958.
3. Whitehair, C. K.: Medicated Swine Feeds. North Am. Vet. (Am. J. of Vet. Sci.) 39 (No. 2) (Feb. 1958): 32.

**Made exclusively by CSC under Patent No. 2,809,892 issued October 15, 1957.*

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Program Arranged For Washington Stockmen's Course

PULLMAN, WASH. — True D. Morse, under secretary of agriculture, Washington, will be one of 80 guest speakers and instructors lined up for the annual Stockmen's Short Course to be held Dec. 8-12 on the Washington State College campus here.

Mr. Morse will address the annual Student-Stockmen Banquet the evening of Dec. 9. He will talk on the subject, "Animal Agriculture Is Vital to a Stronger America."

Other speakers include scientists, specialists, financiers, marketers, engineers, veterinarians, ranchers and authorities from many related fields, according to an announcement by Dr. M. E. Ensminger, chairman of the department of animal husbandry at Washington.

The speakers will talk at 140 lecture or laboratory sessions designed to help producers of beef, sheep, swine and horses to keep pace with progress. Dr. Ensminger said the session offers special information for managers, foremen and herdsmen as well as farm and ranch owners, livestock market specialists and others.

Four new study areas will be offered this year, he said. The new areas include credit and financing; integration and agribusiness; changes in marketing, processing and meat sales, and changes in farm life.

Seven financial experts will discuss methods of financing livestock operations, including short-term, intermediate and long-term loans. This group will also forecast the economic future.

The latest in breeding, feeding care and management, and marketing of all classes of livestock will be presented as in former years.

Animal scientists on the short course staff include Dr. Alex J. Wood, University of British Columbia, Vancouver, B.C.; Dr. W. E. Rempel, University of Minnesota, St. Paul; Dr. Charles S. Hobbs, University of Tentenessee, Knoxville, and Dr. Ralph Bogart and Dr. J. E. Oldfield, Oregon State College, Corvallis.

Researchers from industrial laboratories on the visiting-professor list include Dr. C. F. Chappel, Eli Lilly & Co., Indianapolis; Dr. R. W. Colby, Dow Chemical Co., Lake Jackson, Texas; Dr. H. J. Hill, Armour & Co., Denver; Dr. Gordon Holleman, Jr., Swift & Co., Frankfort, Ill.; Dr. William P. Johnson, American Cyanamid Co., Princeton, N.J., and Dr. Laurent Michaud, Merck Sharp & Dohme research laboratories, Rahway, N.J.

FEED MILL SOLD

OSCEOLA, WIS. — Sale of the Corey Feed Mill, Osceola, to the Polk County Cooperative recently brought to an end 60 years of operation of the mill by the Corey family.

Iowa Sheep Day Visitors Told How To Handle Lambs

AMES, IOWA — There's only one answer to the question of how to handle heavy feeder lambs, Dr. Walter Woods, nutritionist, told All-Iowa Sheep Day visitors here. "Get them on feed as soon as possible and get as much finish on them as you can in a short time," he said.

He said that research with new feeding programs, feed additives, pelleted feeds and different kinds of feed mixtures in the past few years have pointed up this fact.

He said complete pelleted feeds have increased daily gains. The increase in daily gains was greater for pelleting of rations containing low-quality roughage. However, the total daily gains in Iowa experiments averaged only .45 lb. per day for an unpelleted ration containing alfalfa hay, compared to .5 lb. daily for lambs getting pelleted concentrate rations containing alfalfa and .56 lb. daily for a highly fortified ration containing oat hulls.

In Illinois tests, Dr. Woods said, pelleting increased gains on rations with low-quality hay about .16 lb. per head per day as compared to unpelleted low-quality ration. The high-quality ration, when pelleted, added only .03 lb. daily gain over what it was producing as loose ration. The average market grade of lambs decreased as the percentage of roughage in their rations increased.

Dr. Woods said he believed pelleting will not affect the small feeder who has hay and corn on his place. Large lamb feeders may be interested in other advantages not concerned with rate of gain—such as easier self-feeding, less feed wastage and control of the ratio of concentrate to roughage.

Costs Up Slightly

In tests to determine the cost of pelleting lamb feed, Dr. Woods said, the college researchers found that grinding and mixing lamb feed added about 2¢ to the cost per pound of gain. Pelleting added another 0.4¢ cost per pound of gain. These increased costs of gain, he said, indicate there is probably no economy of gain in pelleted feeds for sheep.

In the field of additives for lamb rations, Dr. Woods pointed out, the response to stilbestrol is better when it's fed with high-concentrate rations. There are research reports from various stations showing both tranquilizers and stilbestrol increase gains for lambs. However, the results are not uniform. In one Iowa test neither stilbestrol nor tranquilizer increased gains on lambs. The effect of stilbestrol for ewes has not been promising.

Dr. Woods reported that researchers have also been studying the possibility of getting faster gains by starting lambs on a full feed of soybean meal. Under this program, corn gradually replaces the soybean meal. By the end of 21 days of the soybean "starter" program the lambs were on full feed of corn.

He said the increased amount of feed eaten by the soybean-fed lambs resulted in increased gains in the first part of the feeding period. However, most of the advantage was lost by the end of the finishing period. Lambs that had not received the "starter" feed of soybean meal, did not gain as fast during the time they were "working up" their appetite for corn in the first 21 days. They made up for this by faster gains on corn late in the feeding period.

Current research results add up, Dr. Woods said, to the principle of placing first reliance on high energy rations supplemented with high-quality forage.

KNOW THIS MAN?

This is Gerald Perrinjaquet, owner of Perrinjaquet's Edgewood Feed Mill, Edgewood, Iowa. Gerald's father, Louis H. Perrinjaquet, became Hubbard's Sunshine feed dealer in 1937. Ten years later, in 1947, Gerald became manager and, in 1954, owner.

"Hubbard is always ahead in all new things that come along," Mr. Perrinjaquet says. "We always look to Hubbard's for up-to-the-minute feed products and progressive feeding programs."

Gerald is keeping his mill up-to-the-minute, too. Recently installed were three bulk mixing bins, with a capacity of 12 tons each, for handling Hubbard's feed concentrates and ingredients in bulk.

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UP OR DOWN?

By Leonard W. Schruben

Agricultural Economist, Kansas State College

Grain Sorghum Situation

Another big grain sorghum crop is in prospect. Over 600 million bushels, according to the October estimate of the Crop Reporting Board, will be harvested this year.

A harvest this size comes as a surprise after the record 1957 crop. Only last spring this writer said: "It appears as though 1957 was an exception, and the record of production (of grain sorghum) will stand for some time." Acreage did come down by the expected 3 million. But yield is up, with the result that 1958 production is 8% above 1957, and almost four times the recent ten-year average.

As my favorite football coach remarked after a winless season, "you can't expect to win all the time."

What about prices in 1959? What is ahead for the grain sorghum producing area? What can you as a feed manufacturer do about it? Two things stand out as important considerations. One is the strong seasonal tendency for prices to recover after November. The other is the importance of price supports.

In the past, prices have tended up after harvest. Exhibit 1 shows the per cent of times U.S. farm prices for grain sorghums have gone up after a given month. It covers 20 years and is appropriate to consider under present circumstances. It looks complicated at first glance, but it is easy to use once you learn how.

Here is how to use Exhibit 1. First find the current month on the left side. In this case it is November. Now read over to the month when you may want to sell. In the December column you will find a 76. That means that in about three years out of four prices have gone up from November to December. Under the June column on the same line you will find an 85. This means that prices advanced from November to the following June over eight out of ten times.

Other months may be read in the same way. For example, on the December line you will find a 95 under January. Almost every year U.S. farm prices have gone up from December to January.

Price Supports Key

An effective floor under prices is expected. Every producer is eligible to obtain a loan on grain sorghum if it is in suitable storage. Harvest reports indicate much of it is dry enough to store or is being dried. Also, there is less pressure for storage space than earlier expected. If these reports turn out to be correct, downward pressure on prices will ease by January.

Prices have dropped below support rates several times since the loan program was started in 1940. However, they are somewhat lower than corn supports when feeding value is considered. Because of competitive relationships, corn prices are important in determining grain sorghum prices.

Summary

Harvest season prices dipped below support rates. Prices are likely to remain below support levels most of the coming feeding season with a slow recovery expected through midspring. Compared with loan rates, farmers can hardly afford to sell on the cash market. Therefore, supplies available for use in feed manufacturing are expected to be limited through mid-winter.

EXHIBIT 1. Grain Sorghum: Average Price Received by Farmers, U.S., Percent of Times Price Went UP from Base Month to subsequent Month, 1933-1953.

Base month	Subsequent month																					
	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
January	52	67	76	76	81	71	57	57	57	57	52	60											
February		86	81	90	81	71	52	52	52	57	52	60	60										
March			86	81	81	71	52	52	57	52	52	60	60	65									
April				76	76	67	52	52	52	43	48	60	60	65	60								
May					57	57	52	52	48	43	48	60	60	65	60	60							
June						52	52	48	48	33	33	60	50	55	80	65	65						
July							33	43	33	33	33	45	40	45	55	60	55	55					
August								43	24	33	33	50	45	55	60	60	60	60	60				
September									24	24	38	55	45	55	65	65	75	70	65	55			
October										29	57	70	75	80	85	85	85	75	65	60	55		
November											76	85	75	90	90	95	85	75	70	60	55	60	
December												95	85	80	85	85	80	75	70	55	55	55	55

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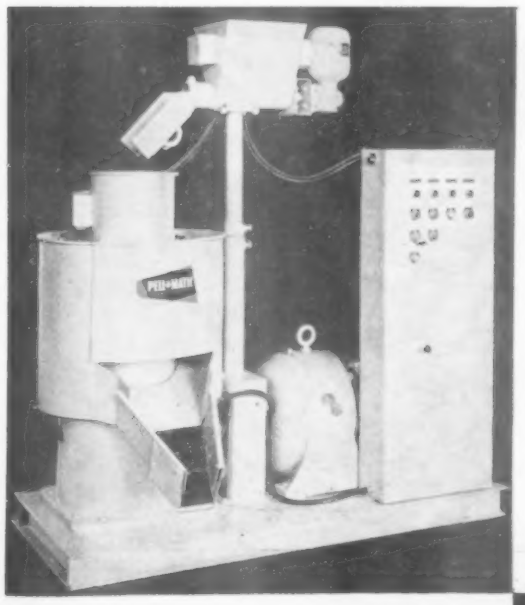

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Feed for Thought

By J. R. LINSNER

Progressive Nutrition

November 12 through 14th the Animal Feed Production School sponsored by the Midwest Feed Manufacturers Association will be held in Kansas City. The Peter Hand Foundation congratulates the progressive minded feed manufacturers who will be enrolled at the production school.

Our industry has developed tremendously within the past ten years. This development has placed feed manufacturing within the ten top industries of our nation. An eminent agricultural authority has predicted that by 1975 we will be producing 50% more animal and poultry feed than we are manufacturing today. To continue this development, we need progressive thinking in all facets of our industry—in research, production, service and sales.

The feed production school presents new ideas in handling, warehousing and manufacturing feeds. You will put these new ideas into effect in your plants as quickly as you can because you know they will help increase your production efficiency, cut production costs or improve the safety record in your plants. You constantly strive to improve your production methods.

We are also continually improving our production methods to improve the quality of our products. New procedures are being developed every day to assure the stability and compatability of the components of our premixes as well as the complete premixes themselves. Our quality control program safeguards your product quality and helps assure protection of your feeds.

Our staff of nutritionists through their library, laboratory and research farm keep their fingers on the pulse of the field of nutrition. Each new discovery is weighed and considered and if of practical application is put to work.

Many new ideas are developed at staff meetings. These are laboratory and farm tested and unless discarded are applied directly to current nutritional problems and recommendations.

Progress is essential to any industry. Any industry that ceases to grow begins immediately to go downhill. There can be no static condition in a constantly changing, dynamic feed industry. Peter Hand Foundation is doing its part to meet the challenge of these changing times by offering you "Progressive Nutrition" in its products and services.

J. R. Linsner
DIRECTOR OF TECHNICAL SERVICE
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Scientist Outlines Laying Cage Management Changes

The present and future of caged layer operations in the light of recent advances in management and feeding were discussed by Dr. J. H. Quisenberry, poultry scientist from Texas A&M College, at the recent Georgia Poultry Institute held at the Rock Eagle 4-H Club Center, Eatonton, Ga.

"Today, laying cages are on the threshold of a new era," he said. "What happens to them in a large measure depends upon new discoveries in breeding, nutrition, disease control, housing and mechanization and how these developments are utilized through their synchronization into an ever-improving cage management program."

Dr. Quisenberry is head of the poultry science department at Texas A&M at College Station, Texas. Material from his talk at the Georgia institute follows:

Since the onset of the laying cage movement in the South, beginning in the early 1950's, a number of significant changes in management have occurred. These changes can be traced to improvements in breeding, better nutrition, reductions in housing costs, shifts in relative costs of various egg production factors, increased control of environment and experience. Because the cage system will remain as one of the important methods of producing eggs in the South, a look at some of the new management practices that have evolved in the past five years should be both interesting and valuable.

The following 11 problem areas have witnessed developments in recent years and are deserving of further consideration:

1. Pullet replacement rates.
2. Culling rates.
3. Type of birds.
4. Lighting during growing and laying periods.
5. Pullet growing programs and their effects on laying house performance.
6. Rations and feeding programs.
7. Fatty liver syndrome.
8. Number of birds per cage.
9. Temperature control.
10. Vaccination and disease control programs.
11. Fly control.

Only one or perhaps two of these are solely cage problems. Others are of concern to floor operators as well.

CULLING RATES: The culling rate largely determines the pullet replacement rate, but there have been important shifts in the culling pattern during the past few years. Today, the emphasis has shifted away from culling on a basis of individual records to the purchase of stock bred to live and lay at a high rate with little or no individual records during the first 8 to 10 months of lay. In many plants, culling after that is largely done on a row or segment of a row record basis, and individuals are sight-culled only.

TYPES OF BIRDS: Cages can be credited with encouraging better record keeping, which in turn has emphasized the need for birds with specifications that will do the maximum job at the minimum cost. (See Table 1.) To do this, laying birds must be bred for:

1. A high rate of production (average 70%).
2. Small to medium body size (3½ lb.).
3. High livability (92% first laying year).
4. Production of eggs with good shells and high interior quality (not over 3% total with poor shells, blood spots and "loss" eggs combined).
5. Maximum vigor and ability to resist stresses and maintain persistence with a minimum of fluctuations in producton rate.

LIGHTING: Work done at the New Hampshire Agricultural Experiment Station demonstrated that the amount of light given to developing pullets influenced age at sexual maturity, but effects of varying light periods during the growing period on laying house performance were not reported. The Ralston Purina Co. in work done at its research farm at Gray Summit, Mo., reported favorable effects on laying performance of turkey breeders raised with restricted light.

Recently Prof. Dale King, Alabama Polytechnic Institute, and the Doane Agricultural Service have reported extremely favorable results from a relatively severe restriction of light to six hours per day during the growing period. Additional research is needed to establish the light schedule for both the growing and production phases that will give optimum performance associated with minimum cost and which will be practical for a given producer's operational program.

Until further experimental work has established the optimum lighting for growing pullets, it would prob-

(Turn to MANAGEMENT, page 134)

TABLE 1. Relation of Breeding, Body Size and Rate of Production to Feed Required Per Dozen Eggs. (Feed Usually Makes Up 50 to 60% of the Total Cost of Producing Eggs.) Texas Data Below Based Upon 308 Birds Individually Fed.

Type of bird	Av. body weight (lb.)	Lb. feed/doz. eggs
Inbred Hybrid No. 1	3.5	3.7
	4.0	3.9
	4.5	4.2
Inbred Hybrid No. 2	3.5	4.0
	4.0	4.2
	4.5	4.5
White Leghorn (L 50)	3.5	3.5
	4.0	4.1
	4.5	4.7
	Av. % production	**Lb. feed/doz. eggs**
Inbred Hybrid No. 1	60	4.8
	70	4.2
	80	3.9
Inbred Hybrid No. 2	60	4.2
	70	3.9
	80	3.6
White Leghorn (L 50)	60	5.1
	70	4.7
	80	4.1

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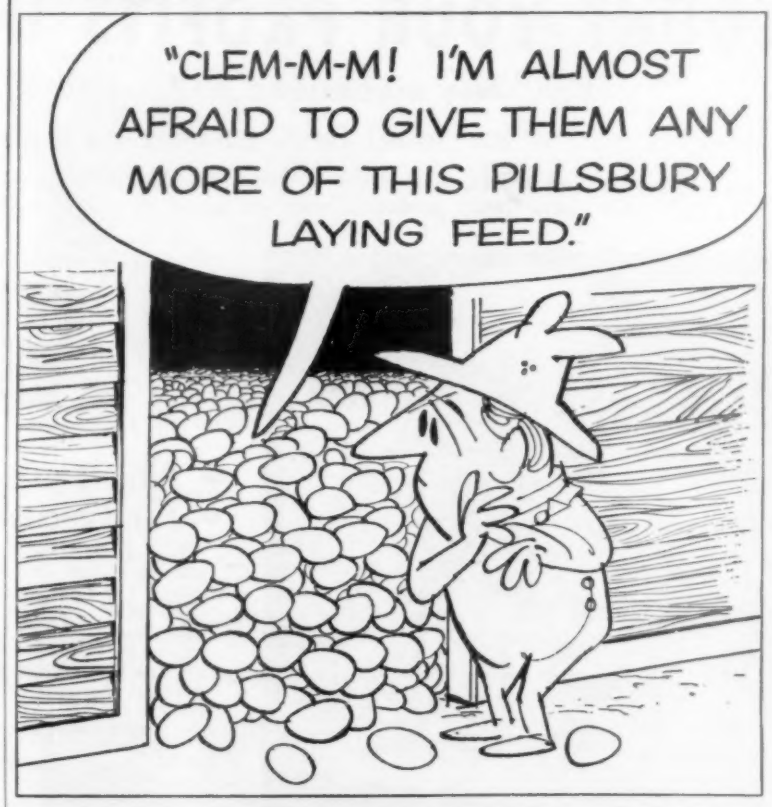

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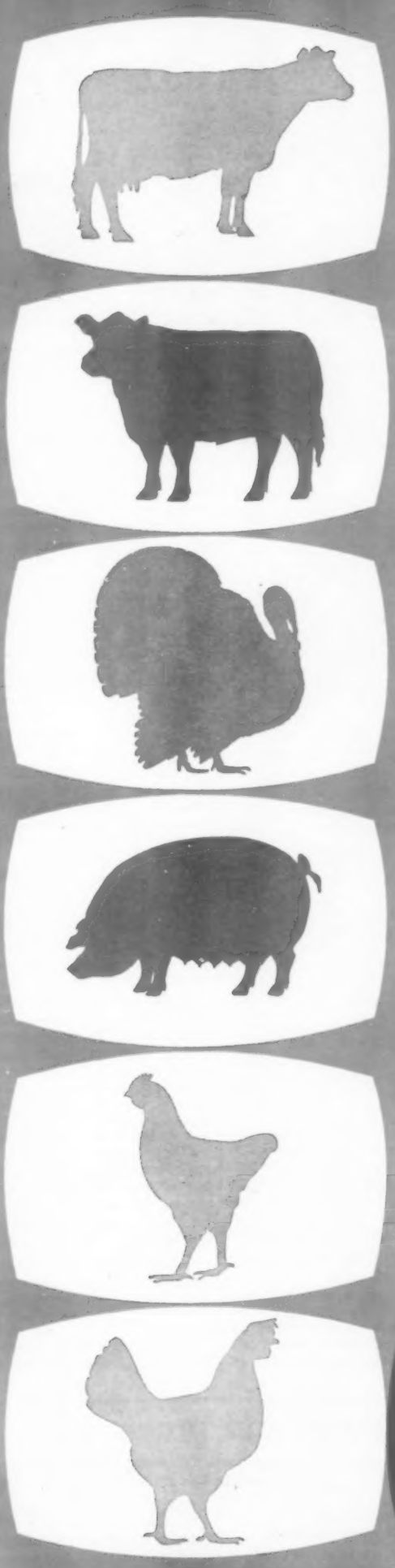

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Serving Time in a Custom Mill

Three major factors in custom milling are quality, service and efficiency. But there's a fourth factor, too — TIME. It's an important component in each of the other three ingredients in this formula for success

By C. I. Finlayson
McMillen Feed Mills

This mill, at Tipp City, Ohio, is cited as an example of some of the modern custom milling operations doing a good job in the way of quality, service and efficiency.

Much has been written in recent years about the feed dealer who is performing custom grinding and mixing to serve farmers in his area.

This man, whom we call the Custom Miller, has received a lot of free advice on how to improve his efficiency and how to give better service to his customers. In spite of all the free advice and the free engineering service of equipment manufacturers, feed manufacturers, etc., everyone recognizes the need for further improvement in the quality, service and efficiency of these mills. Custom millers, themselves, would be the first to admit that some of them do twice as good a job as others. What causes this?

You will all agree that the three important factors in a custom mill are:

1. High Quality Feeds.
2. Good Service.
3. Maximum Efficiency.

I suggest that there is a fourth factor—TIME—and it is an important component in each of the other three. Let us consider the importance of TIME in Quality, Service and Efficiency. But before we get into each factor separately, let's consider a few generalities.

Profit, Quality, Service and Efficiency are definitely related. Sure, custom millers know that they are in business for a profit and that only by continuing to operate at a profit can their whole organization grow and prosper. They also know that only by having High Quality, Good Service and Efficiency can they have a profitable business. They know the importance of these things, but have they taken the time to be sure each of their employees understands them?

C.I. Finlayson

AUTHOR—C. I. Finlayson is production manager for Central Soya Co., Inc., and its feed division, McMillen Feed Mills, Ft. Wayne, Ind. He has been with Central Soya since graduation from Northwestern University in 1936. He was in the company's Decatur, Ind., laboratories and was plant manager at Decatur before becoming company production manager in 1955. In his work with McMillen Feed Mills, he has become well acquainted with the operations and problems of local custom mills.

Operating a successful custom mill is not easy. It is only through good organization that the job can be done. The basis for this good organization is to have each and every employee understand that they all have the same goal—to satisfy the customer through quality, service and efficiency. They must also recognize the importance of the part they play to make the entire picture complete. **This is too important to make any assumptions that anybody knows anything.** Do it on an individual basis. Make it possible for the individual to identify himself with the successful accomplishment of the overall objective. Without this first principle of good organization there is no use proceeding.

Is the mill running the miller or the miller running the mill?

Do you have TIME to face tomorrow's problems today, or are you too busy trying to solve yesterday's? Are you taking TIME to plan? What part of each day or each week do you spend in solving your problems? I mean solving the problem at its cause, not in providing a solution to correct the effect. If the people in charge of running a mill take time to recognize their problems and to face them squarely in a systematic manner, only then can they continue to produce quality feeds, with good service, Efficiently.

TIME AND QUALITY: It is fairly easy to recognize the faults in a layout after it has been in operation for some time, but how many of us charged with operating a mill take the time to outline its requirements in detail before any engineering is begun? Do we specify how important it is to keep whole grain out of concentrate, to limit the use of screw conveyors, to have legs easy to clean and to provide mixers which give the minimum contamination between feeds? Many important quality points are inherent in the original design. We must take the time to recognize them before equipment is installed, or have the courage to face the problem and make the necessary changes to provide quality feeds.

Supervision is a factor in quality which the boss recognizes when his boss, "the customer," complains. A supervisor's time is a most important factor in quality. Yet how much consideration is a supervisor's time given in laying out the average custom mill? I would guess not much, with part of the operation out in the dump, part in the basement, another part on the first floor, second floor, etc.

This factor of control is most important. The custom mills laid out so that they can be closely controlled by one man do a better job on quality and efficiency.

Time to train is an obvious quality consideration. Many times mistakes have been made because it was assumed somebody knew more than he actually did. Get him off to a good start! You can't spend too much time with him the first two weeks. We have found that a simple check list of basic job knowledge and responsibilities is a most effective tool for passing training information along. It helps both the trainer and the trainee.

Responsibility for Quality. Too often we do not take the time to pinpoint the responsibility for quality. The man handling feed or grain may know it is not right, but he may not know you are depending upon him to call it to your attention. Of course, giving someone responsibility without being sure he fully accepts it, can be most dangerous. There are "check points" at many stages in making feed. If each man will take the time and accept the responsibility for checking quality up to and including his operation, the finished product can only be of the highest quality.

Time to make the choice for Quality. The human element is a most important factor in Quality. A good man, well trained, thoroughly indoctrinated in the importance of quality, still must make the right choice. If he has ample time to wait between runs; if he has ample time to clean out the leg boot; if he has ample time to see the boss, his choices for quality will be more consistent. It is easy to see that the better a mill is organized, the easier it is to get the quality job done.

TIME AND GOOD SERVICE: Good Service is so obviously related to time it is difficult to add to the point, yet there are certain basic facts to keep in mind.

Layout is, of course, a major consideration. In some cases flexibility —the ability to do several different things at the same time—can get confused with laying out a mill for good service. For the most part a mill with a clean cut, simple flow will give better service than one going off in all directions at once.

In some cases, too, a mill that can spot four trucks at the dock is thought to be able to give twice as good service as one with two truck spots. Of course, the true measure is the number of bags going across the dock in a unit of time.

In the event of a breakdown in Service—a failure to meet a schedule or the like—it is not always easy to recognize the time of failure. It may seem obvious that at the last minute, when everyone including the bookkeeper was doing everything he could do, there were certain limitations which must be recognized. There is just so much that can be done and that's that. Yet a closer look will show that it was improper use of the time available earlier which really caused failure. **If we recognize the value of time when we can do something about it, we will solve many of our service problems which are caused by peak loads.**

Time is also important to Good Service in the need for communications. Take the time to tell the farmer-customer where he stands; what to expect; or if you have a problem, how it will affect him. Taking the time to express a sincere interest in the service you are or are not giving him will go a long way to help you keep your reputation for Good Service. It is not enough to be concerned with good service. You must make your customer feel it.

TIME AND EFFICIENCY: It is impossible to separate efficiency and "know-how." The best equipment and the best layout won't give you efficiency without "know-how." "Know-how" might be defined as knowing your equipment, understanding what it can do and then getting the most practical results from it. "Know-how" is the unwritten set of standards which recognizes when a good job is being done under the given conditions. "Know-how" is the ability to put your finger on the bottleneck which every operation seems to have.

I would like to pass on to you some figures which you can weigh against your unwritten operating standards. Conditions vary so widely from mill to mill, from one ingredient to another, from one year to another, from one part of the country to another

CHECK YOUR MIXING TIME

"Does your custom mill really stand for quality? If so, check your mixing time." That is one of the points emphasized by the author of the accompanying article.

Mr. Finlayson advises:

"The mixing cycle should be 15 minutes per batch. This includes time to charge the mixer, six to seven minutes for the mix after it has been completely charged, and also the discharge time. . . . In many cases, grain is ground directly into the mixer. This requires valuable time which is then taken from the true mixing time. In many mills, the actual time between the last element of the ingredients added and the first material taken from the mixer is practically zero. This is not good. By being set up to accumulate a surge between the grinder and the mixer, the time to charge the mixer can be reduced to a minute or less. The time gained can be added to the mixing time."

that you must apply your own correction factors.

Receiving:

GRAIN TRUCKS—10 minutes per truck.

The average elevator leg capacity in a custom mill is 3,000 bu. per hour. The average truck capacity is 200 bu.—add to the unloading time, the time to weigh in and out, and 10 minutes is the approximate figure.

GRAIN CARS—One hour per car.

Two thousand bushels using the same 3,000-bu. leg, plus time for opening the car, starting the equipment and so forth—approximate time is one hour.

BULK INGREDIENT TRUCKS—one hour, 30 minutes per truck.

This is based on 20-ton capacity trucks using either air or augers or power shovel.

BULK INGREDIENT HOPPER CARS—one hour, 30 minutes.

Thirty-ton hopper cars using average equipment, under track auger with vertical lift, or elevator—adds up to approximately one hour, 30 minutes.

BULK INGREDIENTS IN BOX CARS—five man-hours.

This is based on the assumption that a power shovel would be used and that either one or two men might be employed, depending upon the size of the mill.

BAGGED INGREDIENTS IN BOX CARS—10 to 15 man-hours.

A 30-ton car of bagged ingredients will require from 10 to 15 man-hours depending upon the distance the bags must be moved from the car.

LIQUID INGREDIENT TRUCKS—a 3,000-gal. truck—45 minutes.

LIQUID INGREDIENT TANK CARS—8,000 gal.—1 hour, 45 minutes.

Grinding:

Grinding with 75 H.P. hammermill.
Fine—3½ tons per hour.
Medium—5 tons per hour.
Coarse—7 tons per hour.

Mixing:

The mixing cycle should be 15 minutes per batch. This includes time to charge the mixer, 6 to 7 minutes for the mix after it has been completely charged, and also the discharge time. The conflict between quality and service in the average custom mill is at the point of the mixer. In a great many cases, grain is ground directly into the mixer. This requires valuable time which is then taken from the true mixing time. In many mills, the actual time between the last element of the ingredients added and the first material taken from the mixer is practically zero. This is not good. By being set up to accumulate a surge between the grinder and the mixer, the time to charge the mixer can be reduced to a minute or less. The time gained can be added to the mixing time. **Does your mill really stand for quality? Check your mixing time!**

Sacking:

Sacking from the mixer and loading into a truck, including closing the bag, is normally done at a rate of approximately 4 bags per minute.

Loading:

It takes 40 minutes to load a 4-ton truck. In addition to the actual time to load the 80 bags, there is time required for the preparation of the truck and lost time between the various types of feed.

Bulk truck loading requires 30 minutes for a 5-ton load direct from the mixer.

SUMMARY: Profits are definitely related to Quality, Service and Efficiency. TIME is the fourth ingredient in this formula for success. Take the time for planning. Give your men time to make a quality product. Take the time to schedule so that you will be able to give good service. Establish a set of standards for each of your unit operations so that you may measure your progress.

When serving time in a custom mill, why is there never enough time to do it right . . . and always enough time to do it over?

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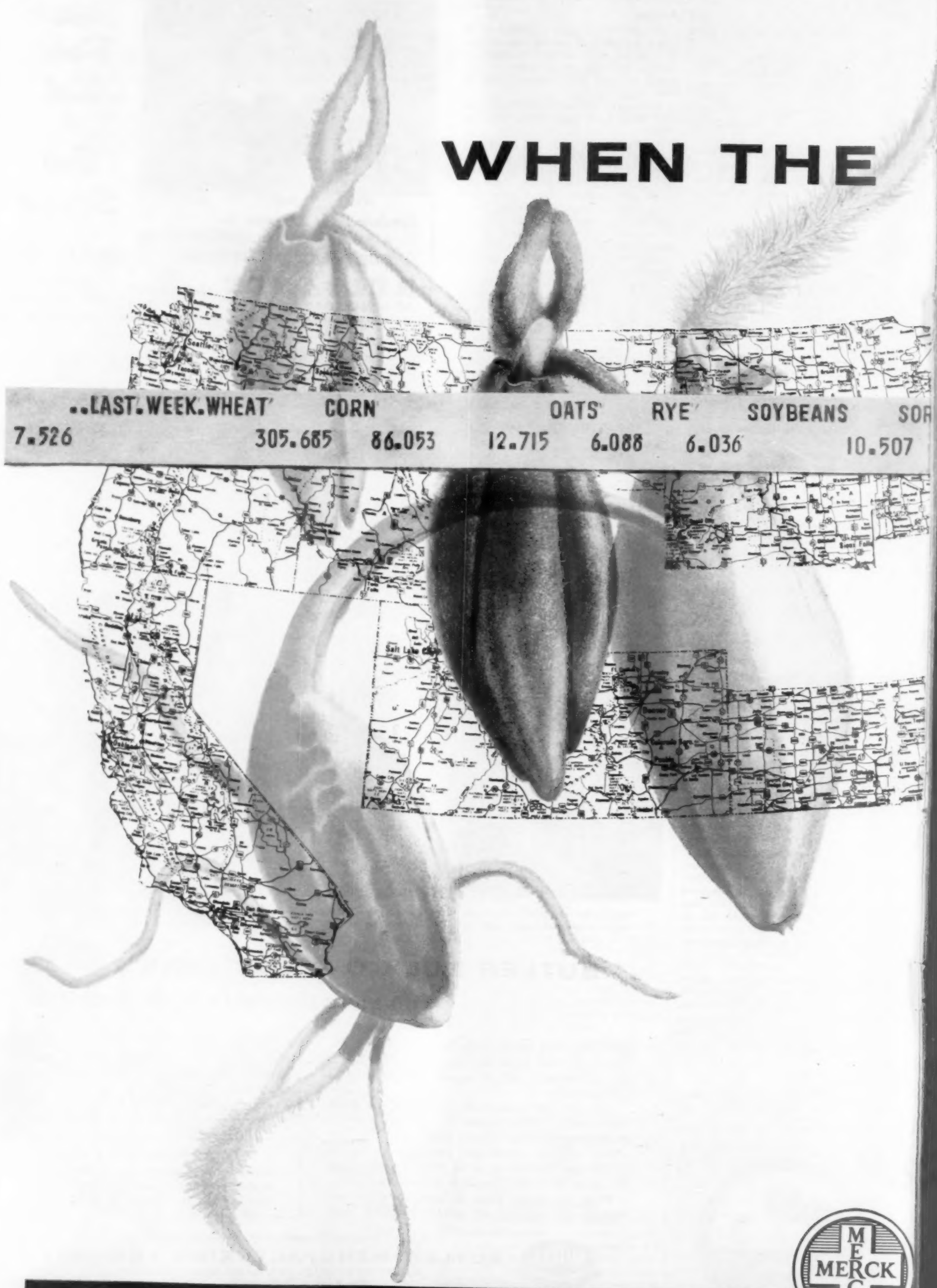
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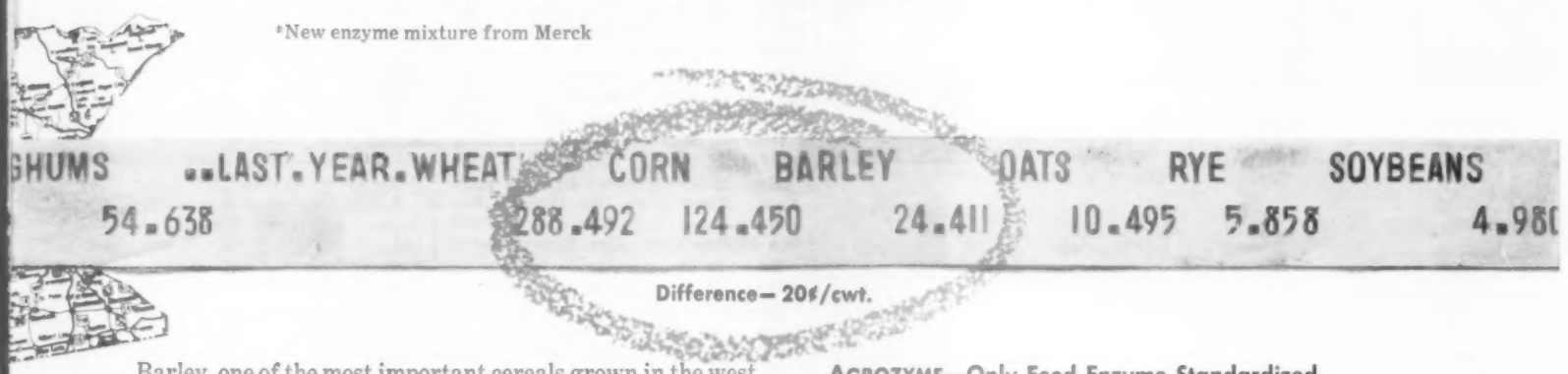

Barley, one of the most important cereals grown in the west, should be fed as the principal grain if the price is right and, if AGROZYME is added to overcome problems of growth depression, lowered feed efficiency (in comparison to yellow corn diets) and sticky droppings.

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Tramp iron in your product can damage expensive machinery . . . cause fires . . . kill cattle and poultry . . . hurt your reputation. Safeguard your investment with one of the many Eriez magnetic separators available to the milling industry. An Eriez Plate Magnet in a food processing line (shown here) traps about a pound of tramp iron daily, and is annually saving $5,000 in repairs, plus 200 man-hours in downtime. You, too, can have this same low-cost protection with Eriez.

Protect your equipment and reputation with an Eriez permanent magnetic separator, designed to pull tramp iron from feed and grain processing lines of all types.

ERIEZ HI-POWR MAGNETIC SEPARATORS

ERIEZ HI-VI VIBRATORY EQUIPMENT

Magnetic Pulley—for separating tramp iron from materials conveyed on belts of rubber, canvas, leather, stainless steel or any other non-magnetic substance. Automatically cleans itself of accumulated iron. Belt widths and diameters in varying sizes.

Grate Magnet—ideal for surge- or choke-fed lines. Material is directed by iron grill onto powerful magnetic tubes. For floor openings, hoppers, chutes, and ducts. Also drawer-type models for enclosed passages.

Magnetic Drum—used when materials are not conveyed on belts. For wet or dry lines. Accumulated iron is automatically dropped out of the magnetic field, away from the material. Various drum widths and diameters.

All Eriez Magnets are non-electric, self-contained, easily installed. They operate without any wires or attachments. Magnetic power is guaranteed forever . . . first cost is the last.

NEW! Economical Mill Mutual Accepted electro-permanent Vibratory Feeders for hazardous, dusty locations . . . no rectifier needed!

New design concepts, new construction materials in these revolutionary HI-VI Vibratory Feeders!* Operate at 3600 CPM directly off an AC line; just plug or wire in. Fully enclosed power element is dust and moisture resistant. Long-life glass fiber springs. Variable feed rate (ounces to tons) provides accurate, automatic feed of all types of bulk materials. For spreading, aerating, cooling, proportioning, screening, etc. Increase production, reduce operating and maintenance costs. Write for big Vibratory Fact File. *Pat. Pending.

FREE LITERATURE on all these magnets mailed on request
Write to: Eriez Mfg. Co., 118-LA Magnet Dr., Erie, Pa.

CONVENTION CALENDAR

Nov. 12-14 — Feed Production School; American Royal Bldg., Kansas City; sponsored by Midwest Feed Manufacturers Assn.; executive vice president, Lloyd S. Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Nov. 13-14—Cornell Nutrition Conference; Hotel Statler, Buffalo, N.Y.; chm., Prof. Charles Chance, Wing Hall, Cornell University, Ithaca, N.Y.

Nov. 14—Small Mill Short Course; American Royal Bldg., Kansas City; sponsored by Midwest Feed Manufacturers Assn., executive vice president, Lloyd S. Larson, 20 W. 9th St. Bldg., Kansas City 5, Mo.

Nov. 15—Missouri Sheep Day; University of Missouri, Columbia; chm., C. V. Ross, Animal Husbandry Dept.

Nov. 20—Ohio Grain, Feed & Farm Supply Marketing Conference; Ohio State University, Columbus; chm., Dr. John Sharp, Department of Agricultural Economics.

Nov. 21—Rutgers School for Poultry Servicemen; Rutgers University, Brunswick, N.J.; chm., John Bezpa, Extension Specialist in Poultry Husbandry.

Nov. 23-25—Western Grain & Feed Assn.; Hotel Fort Des Moines, Des Moines, Iowa; sec., Bob Skinner, 928 Des Moines Bldg., Des Moines, Iowa.

Nov. 28-29—American Society of Animal Production; Hotel Sherman, Chicago, Ill.; sec., H. H. Stonaker, Animal Husbandry Dept., Colorado State University, Fort Collins, Colo.

Nov. 30-Dec. 1 — Tennessee Feed Manufacturers Assn.; Noel Hotel, Nashville, Tenn.; sec., Charles H. Warfield, 602 American Trust Bldg., Nashville 3, Tenn.

Dec. 3—Ontario Retail Feed Dealers Assn.; King Edward Sheraton Hotel; Toronto; sec., Murray H. McPhail, 60 Yonge St., Toronto 1, Ont., Canada.

Dec. 8-9 — Veterinarian-Nutrition Conference; President Hotel, Kansas City; sponsored by Midwest Feed Manufacturers Assn.; exec. vice president, Lloyd S. Larson, 20 W. 9th St. Bldg., Kansas City, Mo.

1959

Jan. 5-6 — Kansas Formula Feed Conference; Kansas State College, Manhattan, Kansas; chm., Dr. Tom Avery, Poultry Department.

Jan. 6-7—Elevator Business Managers Clinic, Michigan State University, Kellogg Center, East Lansing, Mich.; chm., Earl H. Brown.

Jan. 6-8—National Turkey Federation Convention and Exposition; Veterans Auditorium, Des Moines, Iowa; sec., M. C. Small, P.O. Box 69, Mt. Morris, Ill.

Jan. 9-10 — Kansas Seed Dealers Assn.; Hotel Broadview, Wichita; sec., O. E. Case, 609 Wiley Bldg., Hutchinson, Kansas.

Jan. 11-13—Northwest Retail Feed Assn.; Hotel Pick-Nicollet, Minneapolis; sec., W. D. Fleming, 112 Grain Exchange Bldg., Minneapolis, Minn.

Jan. 18-20—Indiana Grain & Feed Dealers Assn.; Claypool Hotel, Indianapolis, Ind.; sec., Fred Sale, 600 Board of Trade Bldg., Indianapolis 4, Ind.

Jan. 20-21—North Dakota Poultry Industries Convention; Elks Club, Fargo, N.D.; chm., B. J. Duke, North Dakota Poultry Improvement Board, Bismarck, N.D.

Jan. 26-28 — Southeastern Poultry & Egg Assn., Atlanta, Ga.; sec., Harold E. Ford, 235 E. Ponce de Leon Ave., Decatur, Ga.

Jan. 28-30—American Dehydrators Assn., Shamrock-Hilton Hotel, Houston; exec. vice pres., Joseph Chrisman, Board of Trade Bldg., Kansas City 5, Mo.

Jan. 29-30—Oregon Animal Industry Conference; Oregon State College, Corvallis; sponsored by Oregon State College and Oregon Feed & Seed Dealers Assn.; sec., Russ Hays, 702 Lewis Bldg., Portland, Ore.

Feb. 6-7—Minnesota Turkey Growers Assn.; Leamington Hotel, Minneapolis; sec., A. E. Eisenmenger, 2200 University Ave., St. Paul, Minn.

Feb. 9-10—Montana Nutrition Conference; Montana State College, Bozeman, Mont.; chm., Dr. O. O. Thomas, Animal Industry Dept.

Feb. 11-12 — Feed Mill Production School; Leopold Hotel, Bellingham, Wash.; sponsored by Washington State Feed Assn.; mgr., J. G. Wilson,

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- Sugar
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- Dried Buttermilk

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CALENDAR FOR 1958-59

NOVEMBER

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814 Second Avenue Bldg., Seattle, Wash.

Feb. 12-13 — Washington State Feed Assn.; Leopold Hotel, Bellingham; mgr., J. G. Wilson, 814 Second Avenue Bldg., Seattle, Wash.

Feb. 13-15—Institute of American Poultry Industries' Fact Finding Conference; Municipal Auditorium, Kansas City, Mo.; Institute of American Poultry Industries, 59 E. Madison, Chicago 2, Ill.

Feb. 16-18—Midwest Feed Manufacturers Assn., annual convention, Muehlebach Hotel, Kansas City, executive vice president, Lloyd Larson, 20 West Ninth St., Kansas City, Mo.

Feb. 22-24—Colorado Grain, Mill & Feed Dealers Assn.; Shirley Savoy Hotel, Denver, Colo.; sec., Olaf Erickson, 714 Cooper Bldg., Denver 2, Colo.

Feb. 23-26 — Colorado Livestock Days; Colorado State University, Ft. Collins, Colo.; chm., Dr. Lamar Esplin.

Feb. 24-25—Virginia Feed and Nutrition Conference; Hotel Roanoke, Roanoke, Va.; co-chm., Wm. G. Ritchie, J. S. Ritchie & Sons, Petersburg, Va., and Paul M. Reaves, professor Dairy Science, Virginia Polytechnic Institute, Blacksburg, Va.

Feb. 26—Illinois State Turkey Growers Assn.; Animal Sciences Laboratory, University of Illinois, Urbana, Ill.; sec., S. F. Ridlen, Poultry Extension Specialist.

March 1-3 — Ohio Grain & Feed Dealers Assn., Inc.; Neil House, Columbus, Ohio; sec., G. E. O'Brien, 710 N. Ohio Street, Greenville, Ohio.

March 19-20—Oregon Feed & Seed Dealers Association; Multnomah Hotel, Portland; sec., Russ Hays, 702 Lewis Bldg., Portland 4, Ore.

March 19-20—Maryland Nutrition Conference; Shoreham Hotel, Washington, D.C.; chm., Dr. Richard D. Creek, Poultry Husbandry Department, University of Maryland, College Park, Md.

March 25—Distillers Feed Conference; Sheraton Gibson Hotel, Cincinnati; sponsored by Distillers Feed Research Council; exec. director, Dr. Lawrence E. Carpenter, 1232 Enquirer Bldg., Cincinnati 2, Ohio.

April 2-4—Pacific Dairy & Poultry Assn.; Coronado, Cal.; sec., Carl E. Nall, 1304 E. 7th St., Los Angeles.

April 12-17—Grain Elevator & Processing Superintendents; Multnomah Hotel, Portland, Ore.; sec., Dean M. Clark, 1120 Board of Trade Bldg., Chicago 4, Ill.

April 30-May 2—Kansas Grain & Feed Dealers Assn.; Broadview Hotel, Wichita, Kansas; sec., O. E. Case, 901 Wiley Bldg., Hutchinson, Kansas.

May 8-10 — Grain Processing Ma-

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At 2 to 4 oz. Accuracy!

*Duplex models available at **double** speeds

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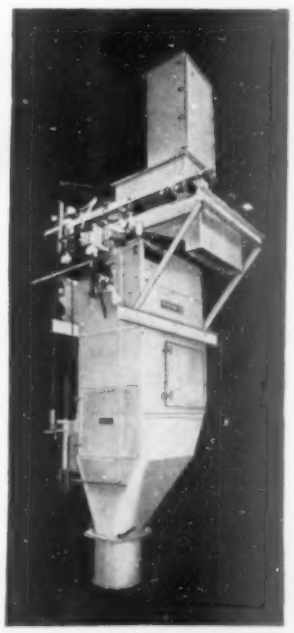
An all-purpose feed bagger, the GB-38 weighs all feeds from mashes to range cubes to 30% molasses into 50, 80 or 100-lb. bags. Fully automatic, the scale operates with Weights and Measures approved sensitivities. Inner parts are stainless steel and washable. For dairy feeds, Teflon lining is available. Durable construction and simple operation, understandable to every mill man, mean long years of trouble-free service.

The GB-38 Bagging Scale is a product of the world's foremost manufacturer of automatic weighing and proportioning equipment. Every installation is backed by Richardson's nationwide network of service facilities. When required, assistance is available within 24 hours. For further information on how the Richardson GB-38 can help you achieve new efficiency and economy in your bagging operation, write today.



Richardson GB-38 Bagging Scale, featuring belt feeder, variable feed control, remote compensation, counter and, above all, *extreme accuracy at high speeds!*

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Also manufactured in Europe to U.S. standards

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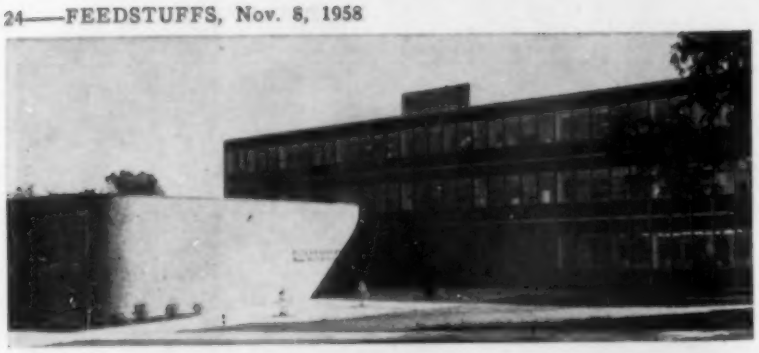

NEW BUILDING—The University of Nebraska college of agriculture has constructed a three-story, million dollar biochemistry and nutrition building on the ag campus at Lincoln. According to the college, the arrangement of work areas in the new building is flexible to allow for redistribution of space between areas when the need arises. The central building contains laboratories, special service rooms and equipment. An attached auditorium seats 192. Special rooms include a radioactive isotope counting room, constant temperature incubator room, animal laboratories and walk-in refrigerated laboratory storage rooms.

chinery Manufacturers Assn.; Chicago; sec., Raymond J. Walter, 511 Fifth Ave., New York 17, N.Y.

May 11-13—American Feed Manufacturers Assn. Convention and National Feed Industry Show; Conrad Hilton Hotel, Chicago; sec., W. T. Diamond, 53 W. Jackson Blvd., Chicago 4, Ill.

May 15-16—Missouri Grain, Feed & Seed Assn.; Hotel Governor, Jefferson City, Mo.; sec., D. A. Meinershagen, Higginsville, Mo.

June 7-9—Indiana Grain & Feed Dealers Association; Sheraton Hotel, French Lick, Ind.; sec., Fred Sale, 600 Board of Trade Bldg., Indianapolis, Ind.

June 7-9 — Eastern Federation of Feed Merchants, Pocano Manor Inn, Pocano Manor, Pa.; sec., Austin W. Carpenter, Sherburne, N.Y.

July 10-14 — Georgia Feed Assn.; General Oglethorpe Hotel, Savannah, Ga.; sec., Will L. Kinard, 3240 Peachtree Rd. Bldg., Atlanta 5, Ga.

Sept. 13-14—Grain and Feed Dealers National Assn. (work meeting for directors, committees and members), Minneapolis; exec. v. pres., Alvin E. Oliver, 400 Folger Bldg., Washington 5, D.C.

Minnesota Researchers Question Additive Need

ST. PAUL, MINN.—If nursing pigs get proper care and the right kind of starter ration, they can make striking growth records without extra feed additives, according to three University of Minnesota swine nutritionists, R. J. Meade, L. E. Hanson and Glen Swartz.

They said they found in recent tests that when pigs and sows that were nursing were fed properly and in good health, the pigs gained 0.72 lb. daily from the time they were 14 days old until 56 days of age. The pigs received no antibiotics or other feed additives, the nutritionists said.

Feed requirement was less than 300 lb. per cwt. gain, for both sows and their litters. This takes into account both the feed eaten by the sows and the weight they lost, the researchers said. Too often the requirement runs close to 400 lb. of feed, Dr. Meade and Dr. Hanson say, but the 300-to-100 level is still within reach of most any producer.

None of the antibiotics or other feed additives used in these tests increased pig gain from 14 to 35 days of age, according to the researchers. However, Aureomycin at 40 gm. and a mixture of procaine penicillin and Streptomycin at the same rate both increased rate of gain by 11% after the pigs were weaned at 35 days of age until the experiment was ended at 56 days.

None of the additives had any important effect on feed efficiency, it was reported.

The secret to the good results from all pigs in this test, the researchers reported, was the management and pig starter. Each litter was on a concrete floor with an automatic waterer. Pig starter was given in a "creep," where sows couldn't get near it. The sows got a high-energy lactation ration through self-feeders.

The pig starter ration contained ground shelled corn, rolled oats, sugar, soybean oil meal, tankage, fish meal, dried skimmilk, steamed bonemeal, trace element salt and a vitamin supplement.

Corn Processing Firm Announces Promotion

CLINTON, IOWA — The appointment of John C. Alderson as district manager in charge of a new district sales office in Cincinnati, Ohio, has been announced by H. A. Bendixen, vice president and general sales manager of the Clinton (Iowa) Corn Processing Co.

Mr. Alderson has been with the company since 1946. Before his new assignment he was assistant division sales manager with headquarters at Atlanta, Ga.

Clinton Corn Processing manufactures corn starch, corn syrup, corn sugar, dextrose, refined corn oil, specialty feeds and lactic acid.

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OLD PROCESS
OIL MEAL
SPENCER KELLOGG & SONS, INC.
MINNEAPOLIS, MINN.
Always
in demand
for its quality
SPENCER KELLOGG'S
OLD PROCESS
LINSEED OIL MEAL
Year after year the demand for Kellogg's famous Old Process Linseed Oil Meal continues. Livestock feeders know from experience that it pays them to use this extra effective conditioner.
SPENCER KELLOGG MEAL SALES OFFICES ARE LOCATED AT:
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Des Moines CH 4-7291
Long Beach HE 2-4954
Minneapolis FE 5-4221
Philadelphia PE 5-8787
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SPENCER KELLOGG AND SONS, INC.
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Complete facilities for both truck and rail shipments

Marion MIXERS
ELIMINATE GUESSWORK IN MOLASSES MIXING!

Complete accuracy in Molasses mixing bag after bag! One mixer For All Your Mixing Needs. Mixes Both Dry and Molasses Feed.
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MERCK

SERVICE BULLETIN for members of the feed and poultry industries

Coccidial Life Cycle .

Prepared for members of the feed and poultry industries in the interest of poultry health. Merck & Co., Inc., Chemical Division, Rahway, New Jersey.

Reprints of this chart, and other articles in the series of Service Bulletins, are available on request.

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MERCK OFFERS AN ACROSS-THE-BOARD PROGRAM FOR COCCIDIOSIS CONTROL

As a result of ten years of continuing leadership in the field of coccidiostats, Merck now provides a family of drugs for the prevention and control of coccidiosis outbreaks.

S.Q.® — the most effective drug for the prevention or control of coccidiosis in turkeys. Also for controlling outbreaks in unprotected flocks—where feed intake has been lowered due to disease or stress conditions—or where breakthroughs occur from uncommon species of coccidia.

NiCarb® — for maximum protection... tried, tested and proved in over 3 billion birds. Now widely used with broilers and with replacement pullets, where there is no problem of accidental feeding to birds in production.

GlyCamide® — best tolerated and highly efficient in permitting top weight gains and feed efficiency in broilers and replacements.

Nature Keeps Equalizing the Odds

The miracle of modern drugs has resulted in disease control never before believed possible. But to some degree, it has also brought about an equalization process ...the emergence of organisms which escape the action of even the most potent drugs. Certain strains of coccidia now appear to fall into this category.

...So, if symptoms of coccidiosis appear in your flocks, consult a poultry pathologist at once to arrive at a sound diagnosis—to determine whether the symptoms are, indeed, due to unusually virulent strains of coccidia or to some other primary or masking infection.

...Keep in mind that maximum profits depend not only on an effective coccidiostat. Management practices for the production of healthy broilers or replacement chicks are essential to any operation.

...Good stock, good feed as well as good management are needed by your flock to obtain the peak of its genetic potential.

Protect flock health... increase poultry profits

GlyCamide • NiCarb • S.Q.

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all with **THE MERCK MARGIN OF SURETY**

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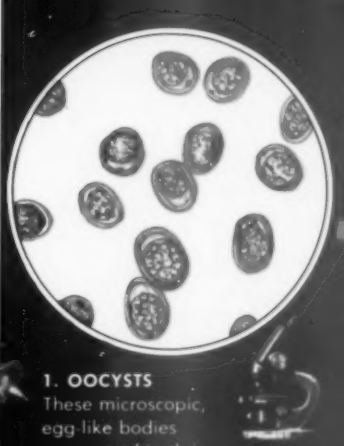
TURKEY COCCIDIA

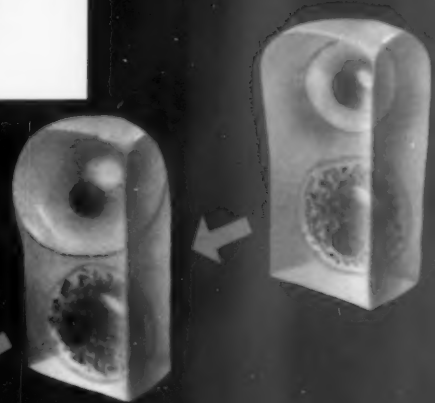
Species	Region of Intestine Affected
E. meleagridis	Cecum
E. meleagrimitis	Upper third of small intestine (*jejunum, duodenum*)
E. dispersa	Duodenum, small intestine and cecum near bifurcation
E. gallopavonis	Lower half of intestine, cecum
E. adenoides	Lower half of intestine, rectum, cecum
E. innocua	Small intestine and part of large intestine (*ileum*)
E. subrotunda	Small intestine and part of large intestine (*ileum*)

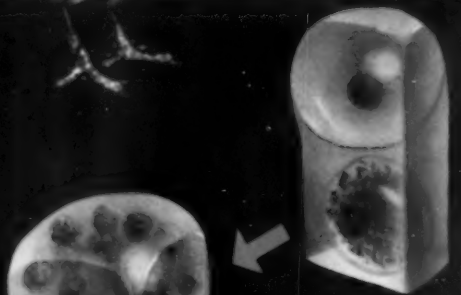
CHICKEN COCCIDIA

Species	Region of Intestine Affected
Eimeria tenella	Cecum
E. necatrix	Middle third of small intestine; occasionally cecum
E. acervulina	Upper half of small intestine
E. mitis	Upper half of small intestine
E. maxima	Middle and lower half of small intestine
E. hagani	Upper half of small intestine (duodenum); some lesions in lower half of gut
E. brunetti	Lower half of intestine; rectum, cecum and cloaca; occasionally upper portion of small intestine
E. praecox	Upper third of small intestine

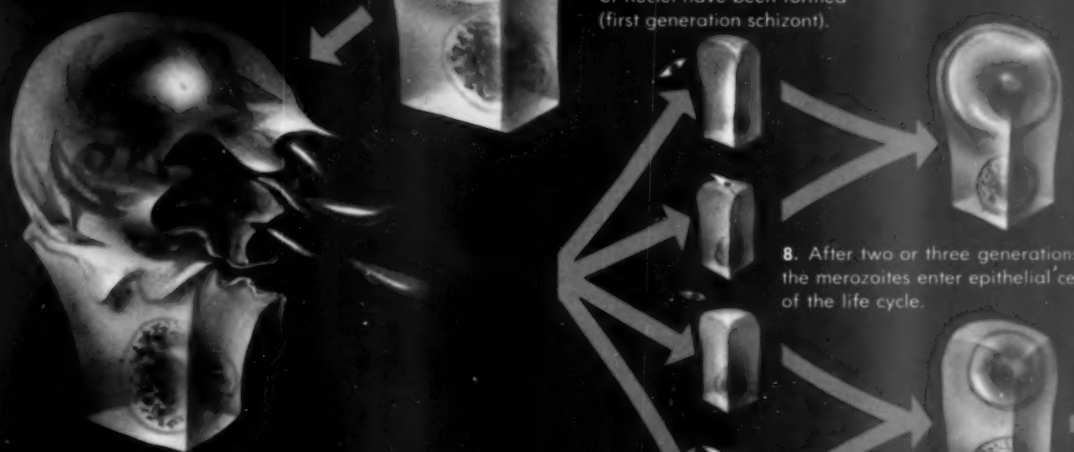


1. OOCYSTS
These microscopic, egg-like bodies are passed in the droppings of birds infected with cecal or intestinal coccidiosis. A field of coccidial oocysts, greatly magnified, is shown above.





6. The nucleus divides and the process is repeated until a considerable number of nuclei have been formed (first generation schizont).



8. After two or three generations the merozoites enter epithelial ce of the life cycle.

Some of the merozoites develop Other merozoites produce female

7. The nuclei contained in the schizont develop into sickle-shaped *merozoites* which lie parallel to each other in formed groups that resemble sections of an orange. The merozoites then break out of the epithelial cells and invade new cells in the intestines to form *a second generation of schizonts and merozoites.**

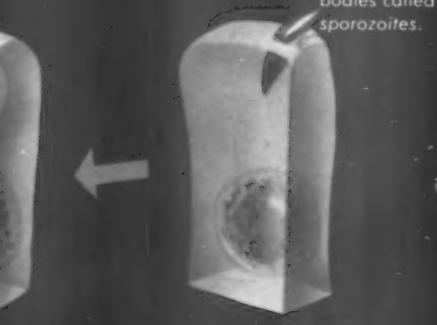
COCCIDIAL LIFE CYCLE

2. SPORULATION

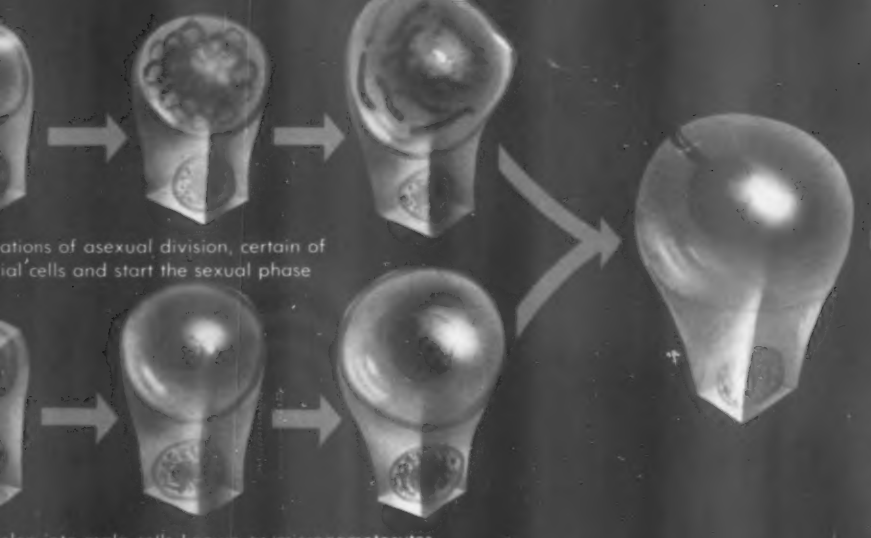
2A. SPORULATED OOCYST
After 24 to 48 hours, in favorable conditions—warmth, moisture and air—four spores develop within the oocyst. Each of the four spores, in turn, forms two banana-shaped bodies called *sporozoites*.

3. Ingestion of ripe or sporulated oocysts brings about the first phase of infection in the bird. Enzymes in the digestive tract (pancreatic juice, in particular) dissolve the protective oocyst wall (*excystation*). The released sporozoites then invade the epithelial cells of the mucosa of the digestive tract.

4. The development of coccidia in the epithelial cells is best illustrated by following a sporulated oocyst through one of the asexual divisions (*schizogony*) and, finally, through the sexual phase of the life cycle.



5. Each sporozoite released from the sporocyst penetrates the wall of an epithelial cell and develops into a rounded body enclosing a nucleus (*trophozoite*).



ations of asexual division, certain of
ial cells and start the sexual phase

elop into male cells known as microgametocytes,
emale cells or macrogametocytes.

9. The union of the one male cell, or *microgamete*, and one female cell, or *macrogamete* (fertilization), results in the formation of an oocyst which is then passed from the body of the bird, completing the coccidial life cycle.

Coccidiostatic agents such as GLYCAMIDE™ (glycarbylamide), S.Q.® (sulfaquinoxaline) and NICARB® (nicarbazin) are primarily effective against the second generation of schizonts and merozoites. Since sporozoites and *first* generation schizonts and merozoites are not affected, feeding of coccidiostats permits the development of immunity to reinfection.

Dedication Speaker Stresses Industry, College Cooperation

COLLEGE STATION, TEXAS—"There is greater need than ever before for more cooperation between college and industry," said Steele Wright, president of Texas Farm Products Co., Nacogdoches, and a director of the American Feed Manufacturers Assn. Mr. Wright was one of the featured speakers at the dedication of Texas A&M College's new dairy and biochemistry building here recently.

Mr. Wright, who discussed "The Significance of Nutritional and Biochemical Investigations to the Feed Industry," said:

"This building and equipment are a monument to those who have labored to bring national recognition in the field of nutrition and biochemical science to this great institution. The accomplishments made on this campus have helped significantly to make possible the growth of our formula feed industry to be among the top 10 industries in the nation today."

He said the Texas A&M poultry and animal science departments are in the top 10 in the nation, just as the Texas A&M football team is in the top 10.

"The stars of this gridiron of poultry and animal science are here today to honor in the dedication of this building," he said. "These stars are likewise too numerous to mention and their accomplishments too lengthy to relate."

Commenting on the role of the feed industry, Mr. Wright said, "The past 25 years have seen a great revolution in agriculture. Many thousands of small farms have given way to large commercial farms specializing in various phases of animal and poultry production. The formula feed industry has taken a leading role in this specialized and integrated agriculture through training, financing sales promotion, service programs and modern science.

"This progress has been accomplished by applying scientific knowledge developed at institutions such as Texas A&M as well as industry-supported research laboratories and experimental farms."

He then discussed the position of the colleges, saying that the industry needed more trained personnel to carry out its programs.

Integration Discussed At Bankers' Convention

DES MOINES — The fact that bankers as well as farmers are showing an increasing interest in the trend toward integration was noted by a banker and a feed company executive speaking at the 72nd annual convention of the Iowa Bankers Assn. recently in Des Moines.

The speakers were N. A. Wilson, vice president of the Rolfe (Iowa) State Bank, and Maurice Johnson, executive vice president of the Staley Milling Co., Kansas City. (Staley Milling was recently purchased by Spencer Kellogg & Sons, Inc. Feedstuffs, Oct. 18, page 1).

Mr. Johnson discussed generally contract feeding and how it works, and Mr. Wilson talked about the effects of contract feeding on farmers in Iowa.

Another speaker was Walter L. Stevens, Chicago National Livestock Commission. In comparing the current livestock feeding situation with that of 1952-53, he said that "farmers are in a program of high-priced feeding at present, which will result in large tonnages of beef on the market in the first half of 1959.

"There was high-priced feeding in the fall of 1952 and low-priced fat cattle on the market the first half of 1953. Losses to farmers ranged from $6 to $8." While he did not make an outright prophecy that the decline would come in early 1959, he said that "sometimes the past comes back and greets you."

True D. Morse, Under Secretary of Agriculture, addressed the convention on the farmer's position in our national defense program. He declared that an aggressive program for American agriculture is being developed under Ezra Taft Benson. Looking toward the future, he urged farmers to build all grain storage needed on their farms now.

"There is every assurance that it can be paid fully in the next few years," he said. "The big crops of this year and those to follow must be stored."

MORE WHITE LEGHORNS

SALEM, ORE.—The annual report of the Oregon Poultry Improvement Assn. program shows more than 100,000 White Leghorns participating in the program for the first time in five years. Crossbred chickens totaled over 277,000, which is a drop of about 55,000 from a year earlier.

Merger of St. Regis, Kress Box Arranged

NEW YORK—St. Regis Paper Co. and the F. J. Kress Box Co., Pittsburgh, have announced a merger agreement based on exchange of 2¼ shares of St. Regis common stock for each share of Kress. The latter has outstanding 128,200 shares of capital stock.

Kress Box, a long-established manufacturer of corrugated and fiber shipping containers, operates plants at Pittsburgh; Newark, Ohio; Washington, Pa., and Hagerstown, Md., with a total capacity of 6 million sq. ft. of daily production. Sales of Kress in 1958 will approximate $20 million. The company provides employment for about 900 persons at its four plants.

On consummation of the merger, it is indicated Kress Box will be operated as a division of St. Regis, but with the same management policies.

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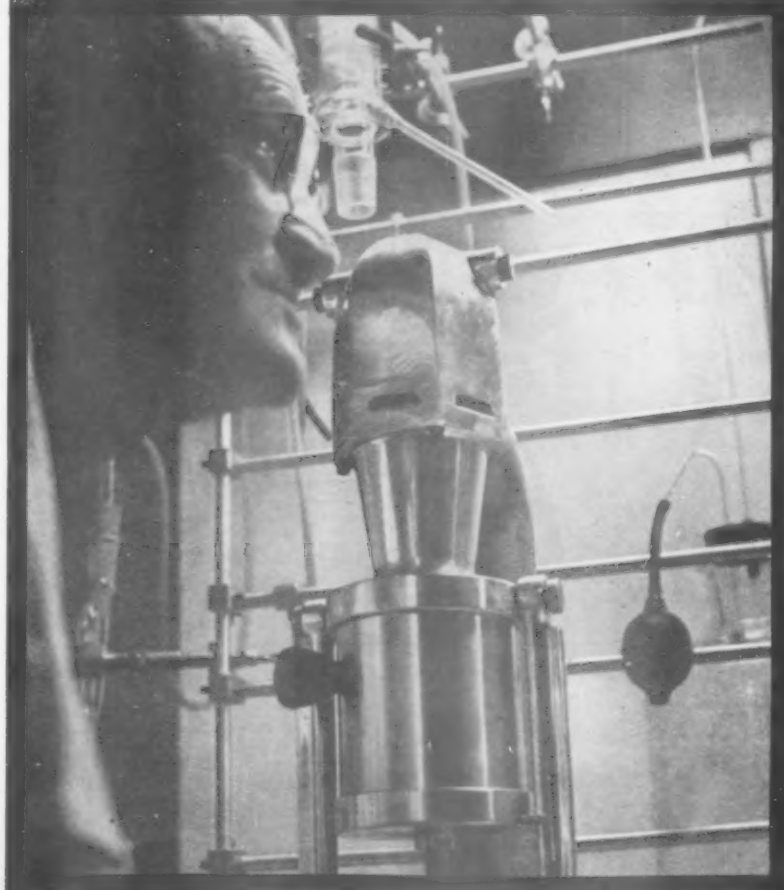

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Bulk Handling of Finished Feed

Points to Consider in Planning and Operating Bulk Systems

By J. D. Johnson
General Mills, Inc.

There is a trend toward more and more handling of finished feed in bulk. Why? Progress can be the answer. But progress in which direction?

Not too many years ago, all of the ingredients used in a feed mill were received in textile sacks, but during the war, due to the shortage of burlap, it was necessary that the manufacturers ship their products in bulk. When the mills learned how to handle a product in this manner, they found there was a distinct saving in the labor. With the continuing increased cost of labor, the question soon arose: Can't the same principles of handling in bulk be used in handling the finished feed? Certainly there are some economies involved. It has reduced the need for a container to hold the feed. It has reduced the number of men needed to package the feed. In addition, it has eliminated the need for men on the farm to open and dump the sacks.

Another factor which has contributed toward the trend to bulk is the fact that farms have increased in size—that is to say, the broiler farmer is a larger operator than in the past, the pig farmer is larger, and so on down the line. With the larger farms came greater requirements for feed and the easier justification for the installation of equipment needed to handle finished feeds in bulk.

Whenever changes are made, it becomes necessary to make some expenditures, and this certainly is true in changing the manner in which feed is handled:

(1) At the mill certain changes must be made in the distributing system, storage of the final product and loading out.

(2) At the farm, a new method of storing feed is needed.

(3) Last, but not least, some method of transporting the product from the mill to the farm is required.

Careful consideration must be given by all parties involved to determine what the original cost will be, what the rate of handling the product must and should be, the volume and variety of items that must be handled, and how much savings can be realized for everyone involved in the process. Within the last five years, there has been a steady increase in the tonnage and percentage of feeds that are handled in bulk, and most likely this trend will continue.

As the product starts at the mill, it seems wise to consider first the effect bulk has on handling of the product.

Storage: Because of the volume and variety of feeds which must be handled, it is difficult to obtain the feeds directly from the production unit. This has necessitated the construction of some type of storage at the mill. Shall it be fixed storage or portable storage? How much will it cost in either case?

Usually bins can be calculated to handle only 50% of the rated capacity due to filling and emptying the bins. Thus, if 10 items were to be handled in bulk, it would be necessary to have at least 10 bins. Then, if 100 tons were to be handled each day, it would be necessary for each bin to have a capacity of 20 tons, giving a total of 200 tons capacity.

Whether or not space can be found within the mill determines whether the bins can be installed inside or must be put outside. In either case, the total investment will run to around $30,000-$50,000 depending upon foundation requirements, distributing system, etc.

Use of portable bins is usually more economical in the original cost. Seventy bins normally will handle 100 tons of bulk per day, as the bins can be filled as soon as they are emptied. Each bin will cost from $30 to $200, depending upon whether it is wood or steel and other variations in design. These one-ton bins are handled by forklift-truck.

To handle 100 tons per day with portable bins:

70 Wooden bins @ $30	$ 2,100
1 Lift truck @ $5,500 (3,000-lb. capacity)	5,500
1 Bin tipper @ $1,500	1,500
Total	$ 9,100
—OR—	
70 Steel bins @ $120	$ 8,400
Rotary head lift truck (4,000-lb. capacity)	7,200
Total	$15,600

It is assumed in the above costs that warehouse space is availabale to store the bins. If not, a warehouse must be constructed and the cost added to the above items to give the total cost.

It may be seen from the above that the original cost for a portable bin installation will be in the $10,000 to $20,000 range. It must be assumed that the more expensive steel portable bins will have a longer life and in the long run would be more economical. If lift trucks are already used for materials handling in the mill, the initial investment can be reduced by the cost of a lift truck.

Conveying: In order to get the feed into storage, it will be necessary to make some rearrangements in the mill—either to convey the product from the mill to the fixed storage, or to spout it to some convenient place where the portable bins can be filled. The cost of such an installation varies a great deal—from a few dollars for a spout and a valve to several thousand dollars for a long conveying system.

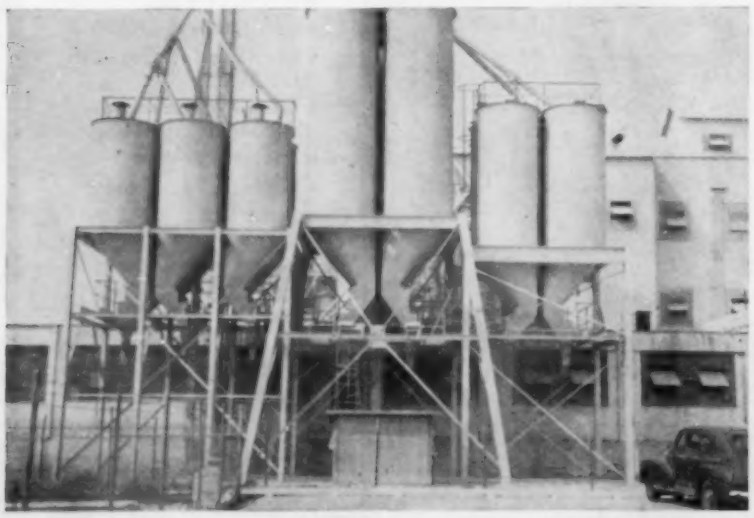
Possible Problems: A great deal of consideration must be given to several items. How is the product to be identified? How can contamination be prevented? How are satisfactory weights obtained?

Product Identification: To identify the product in fixed bins, it is essential to have a bin chart and someone responsible for maintaining the chart indicating what is stored in each bin.

With portable bins, the product is usually weighed at the time the bin is filled and a scale ticket made at that time. Identification of the prod-

J. D. Johnson

AUTHOR—The author of the accompanying article, J. D. (Don) Johnson, is production superintendent for the feed division of General Mills, Inc., Minneapolis, manufacturer of Larro Feeds. He is a graduate of St. Olaf College, Northfield, Minn. Before assuming his present position five years ago, Mr. Johnson was a production supervisor, maintenance supervisor, plant engineer and plant superintendent for General Mills. In his capacity as feed division production superintendent, he is familiar with developments and problems in bulk feed handling over most of the U.S. Mr. Johnson also is known for his activities in connection with the Feed Production School, held annually in Kansas City under the sponsorship of the Midwest Feed Manufacturers Assn. He served as vice chairman of the planning committee for the 1957 school, and he is chairman of the committee which arranged the 1958 school, being held Nov. 12-14.



Facilities for storing and loading out bulk feed at General Mills' Los Angeles plant. The bins are over a 60-ft. truck scale.

One of the bulk trucks in the General Mills fleet. This is a Baughman pneumatic unit.

General Mills feed plants make extensive use of one-ton portable bulk bins, moved by forklift truck. This bin has a hopper bottom with a slide gate. Most of the company's bins have flat bottoms and are emptied by means of a rotary head on the fork trucks.

A complete distributing station, located at Sugar Creek, Ohio. The facilities include a sacked feed warehouse and ten 10-ton bulk bins, with a turnhead for distribution of feed into the bins and a truck scale beneath the bins.

uct is entered when the ticket is made out, and this ticket is inserted into some type of holder on the bin.

Preventing Contamination: Prevention of contamination of bulk products during handling is very important. As the feed man knows, some of the medicants, hormones and minerals can have a deleterious effect on certain animals, and some normal ingredients may be unpalatable to animals other than those for which a particular feed is formulated. Also, a few pellets (even though of the same formula) in a mash feed may raise questions in the feeder's mind.

Thus, it is very important to keep individual feeds separate. If possible, it is best to install equipment that is self-cleaning. If not, it will be necessary to institute some procedure where the system or equipment is cleaned between runs of feed.

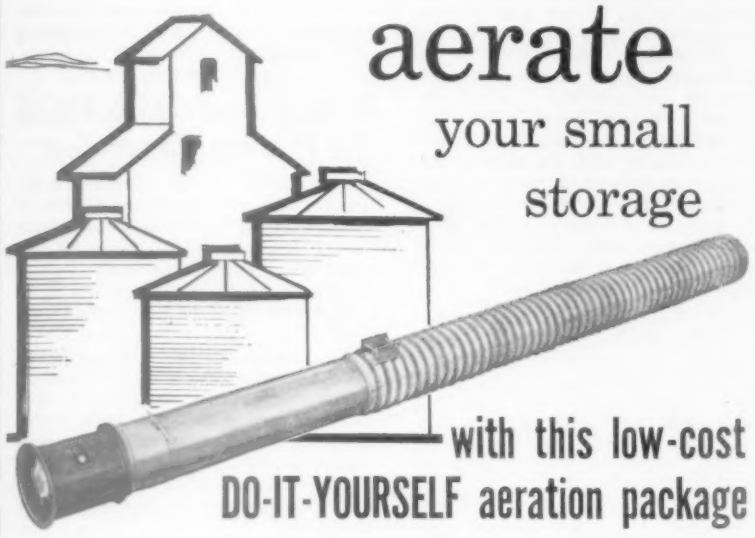
Weighing: One advantage of installing bulk bins outside is that it is possible to install a truck scale immediately under the bins and weigh the product as it is being loaded into the truck. Sometimes it is more economical to install a smaller hopper scale which rolls on tracks under each bin. The cost of the rolling hopper scale is around $2,000 to $3,000, while an adequate truck scale usually costs about $10,000 to $25,000.

In comparing these two methods of weighing, the truck scale saves time in loading as only one weight is taken for each compartment or truck, while the hopper scale usually requires several drafts per compartment or truck.

Fines: Due to the fact that bulk finished feed goes through much more material handling equipment than is required when it is packed in a sack, pellets and crumbles may contain

This bulk tank adjacent to a poultry house is one example of on-farm storage of bulk feed.

This is a Larro bulk feed station at San Martin, Cal. The installation includes eight 10-ton bins. Unloading from rail cars and truck loading are done by drag chains.



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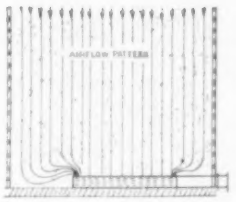

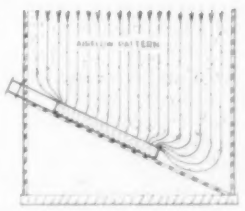

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more fines than are found when the feed is sacked. Careful consideration should be given by mill and bulk station operators, as well as the farmer, to the design specifications of the equipment which is being used in order to eliminate the attrition that can take place in much of the material handling equipment that is now conventionally used. The type of feed handled as well as the type of equipment used, has a definite bearing on the amount of fines produced. Fines generated can vary from 5% to 40%, from the best to worst combination of the above two variables.

Bulk Stations: Since there is a limit to the distance a truck can economically be operated, it has been necessary in some cases to install bulk stations, which are usually in the center of a large feed consumption area. This reduces the number of miles which the truck must go on each run. These bulk stations vary from one or two bins, to 20 or 30 bins. The cost of such stations is determined by the number of bins being installed, as well as the size. This can range from $10,000 for two bins and auxiliary equipment to $150,000 for 30 bins and equipment. In operating a bulk station, the cost varies a great deal, depending upon facilities provided and tonnage handled. A station handling 20 tons per day should require one man and, assuming 100 tons per week and a wage of $75 per week, the labor cost will be 75¢ per ton. The range could easily be 25¢ to $3 per ton.

On-Farm Storage: The customer, or ultimate user of the feed, must consider how many and how large his bins should be. Sometimes it is possible to build a small bin in the upper portion of the building. At other times, it is necessary to install bins on the outside of the building. Feed can be handled either by completely automatic systems that carry the feed from the bin to the feeders, or it is possible to use a small buggy and draw the feed into it and transport it from the bin to the feeders by hand.

Transportation: Bulk trucks cover a wide range in design, efficiency and cost—the simplest being a grain body with tarp, using manpower to unload, having an initial cost of a few thousand dollars. The most elaborate is a 40-ft. semi with pneumatic handling, which, complete with tractor, will cost about $30,000. The amount of feed hauled, the distance and the type of terrain, as well as rate of handling, will determine what equipment is purchased.

Assuming a truck operating in a 50-mile radius, the average round trip would be 65 miles. Actual cost, including labor, is about 30¢ per mile, or about $20 per trip. The number of tons handled and distance per trip will determine the per ton cost. The average is about $3 per ton.

Summary: In summary—there are savings in handling finished feed in bulk, but there are also real costs, and careful consideration should be given to determine whether the savings offset the costs before embarking on this method of handling.

R. M. Grover Appointed To Poultry Extension

AMHERST, MASS.—Robert M. Grover has been appointed extension poultry specialist with the department of poultry husbandry at the University of Massachusetts. Before he assumed his new duties Oct. 1, he was county agent in Middlesex County, Mass.

The announcement was published in a recent issue of Featheredfax, poultry department publication. Mr. Grover's new duties will include being editor of Featheredfax. He is a 1943 graduate of the University of Vermont, and has had seven years of extension and commercial experience in Maine.

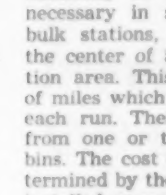
Winners in Honeggers' Sales Contest Named

FAIRBURY, ILL.—Honeggers' recent "Sellarama" contest, termed the biggest and most successful sales campaign in the company's history, has netted 10 dealers and 12 district sales managers a sizeable number of shares of Honeggers' and Co. stock, according to an announcement by Elmer S. Roth, vice president and general sales manager.

The awards, representing more than 700 shares of company stock, were presented to the winners for outstanding sales during the campaign for the three month period of June, July and August.

Winners were selected on the basis of percentage increase over a base quota for selling the complete Honegger program, including feeds, farm buildings and livestock and poultry equipment. The percentage of increase was reported as 39% for feed tonnage sales, 167% on farm buildings, and 158% on equipment sales over sales for the same period in 1957.

Following are the stock-winning dealers in the contest: Eastern division—Jutte Feed & Implement, Celina, Ohio, first; Riegel Feed Service, New Paris, Ohio, second. East central division—Schnaus & Sons, Jasper, Ind., first; Petry's Feed Store, Huntingburg, Ind., second. Central division—Hendrix Hatchery, Kankakee, Ill., first; Honegger Associate Store, Gridley, Ill., second. Western division—Ross River Feed & Hatchery, Maquoketa, Iowa, first; Isenberger Hatchery, Clarion, Iowa, second. Fairchild division—Farmers Grain & Supply, Ulysses, Neb., first; Community Feed & Hatchery, Canton, S.D., second; Milford Consumers Cooperative Assn., Milford, Neb., third; Taylor Produce, Weeping Water, Neb., fourth.



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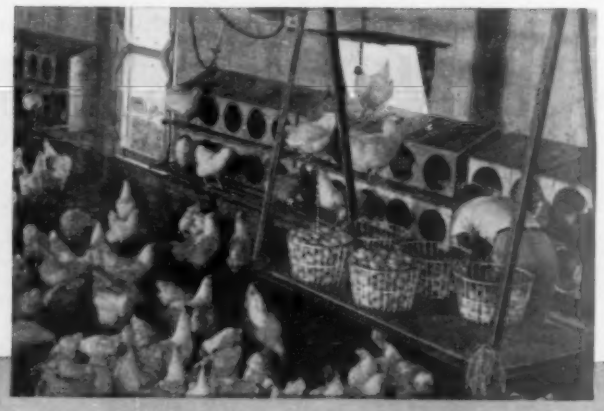

Continuous high-level egg production plus improved feed efficiency

Here is a summary of the performance of Arsanilic Acid in practical feeding tests at five leading agricultural colleges . . .

	% More Eggs	% Less Feed per doz. eggs
S. Dakota Agricultural Experiment Station	1.8% to 4.2%*	0 to 7%*
Michigan State University	5.2%	3.5%
Texas Agricultural Experiment Station	7.9%	5.9%
Colorado Agricultural Experiment Station	13.2%‡	10.2%‡
University of Arkansas	7. %†	4.6%†
	14.9%††	11.2%††

*Range of four tests. ‡Five-month test. †Four-month tests. ††Combination of 50 Gm. Arsanilic Acid plus 10 Gm. furazolidone.

Results of New York Caged Layer Study Reported by Cornell

ITHACA, N.Y.—Caged layer operations in New York have a generally low mortality, good egg production and efficient use of feed and labor, according to a study made recently by Cornell University.

Results of the study were reported in a recent issue of Farm Economics, publication of the department of agricultural economics at Cornell. Physical input and costs and returns data were obtained from 21 operators for the year ending Sept. 30, 1957. Of these operators, 10 kept all of their layers in cages while 11 had combination cage and floor operations.

For the cage enterprises, flock size ranged from 68 to 10,000 layers and averaged 1,481 birds. Mortality averaged 6%; egg production averaged 230 eggs per layer; feed and labor requirements were 95 lb. and 1 hour per layer per year, respectively.

When compared with results of a New York poultry study made in 1955-56, these operations were smaller in size, had higher egg production and feed efficiency, lower mortality and about the same labor requirements. The report said much of the difference in these factors can presumably be attributed to the practice followed by the majority of these operators of keeping the cages filled with productive birds at all times.

Total costs in the laying enterprise averaged $8.09 per layer and about 43¢ per doz. eggs. Returns were $8.35 per layer and about 44¢ per doz. eggs. Thus, profits amounted to 26¢ per layer and about 1¢ per doz. eggs. Feed costs comprised about 50%, labor about 20%, depreciation on the laying flock approximately 15%, buildings 3.1%, equipment 2.5%, interest on flock 0.4% and other costs about 1.5%.

Costs per layer for these flocks were about $1 higher than those in the 1955-56 study. However, with the higher production rates for the caged flocks, the total costs per dozen eggs were about the same. Feed costs were significantly lower for the caged layers due to their greater feed efficiency. In contrast, building and equipment costs were appreciably higher. This was due primarily to the additional investment in cages and accompanying equipment over and above the investment in conventional housing.

The operators of these caged flocks listed four major advantages of caged over floor operations: (1) more positive control over the birds, (2) higher production rates, (3) lower mortality, (4) less feed. The principal problems encountered were wet droppings and flies during certain seasons of the year.

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Full egg baskets and the satisfied smile of your customers are the key to repeat sales on laying feeds.

For less than 40¢ per ton of complete laying feeds, Arsanilic Acid is proving to many feed manufacturers that it is a reliable aid to . . .

- continuous high-level egg production
- improved feed efficiency
- improved hatchability among breeding flocks
- improved feed sales

Arsanilic Acid can help your laying feeds meet the challenge of stresses and sub-clinical diseases that cause slumps in egg production . . . economically, too! (As laying flocks become larger and larger . . . and floor space per bird becomes smaller . . . this will become even more important).

Practical field tests at five leading Agricultural Colleges show that Arsanilic Acid increased egg production from 1.8% to 13.2%. Even at the lowest level of gain, this increase in egg production would net your customers 30 to 40 dozen more eggs per year from each 100 hens.

Arsanilic Acid in layer and pullet feeds gives outstanding results because of its low-cost and proved effectiveness. Plan now to take full advantage of this low-cost growth and production stimulant in 1959 in your Complete Breeder or Layer Feeds . . . Pullet Developer and Growing Feeds . . . Supplements or Concentrates . . . and Trouble Shooting Feeds.

New Technical Information Folder Available

For complete details on the value of Arsanilic Acid in Laying Feeds, including research and field tests, a new technical folder has been prepared for you. Ask for Bulletin No. 402—PRO-GEN® (Arsanilic Acid) for Pullet and Laying Feeds.

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Ontario Feed Meeting Set

TORONTO — Murray H. McPhail, secretary, has informed members of the Ontario Retail Feed Dealers Assn. that the next annual convention of the group will be held Dec. 3, in the King Edward Sheraton Hotel, Toronto.

While all plans have not yet been completed, the preliminary arrangements indicate that the forthcoming convention will be of the usual standard previously enjoyed by the Ontario Feed Dealers, Mr. McPhail said.

One of the principal speakers will be A. W. Archibald, sales manager, feeds division, Master Feeds, Ltd., who will address the meeting on "The 7 Keys That Make a Business Tick." Mr. Archibald will outline some of the more important points which must be taken into managerial account if losses are to be avoided and profits increased.

A second speaker will be Ralph Bennett, chief, livestock marketing division, Department of Agriculture, Ottawa. Mr. Bennett will endeavor to indicate anticipated trends in livestock production and marketing under price supports.

An item of particular interest will be contract farming, which will be dealt with by Dr. David Hopper, associate professor, of the economics department, Ontario Agricultural College, Guelph, as he addresses the convention on "Contracts—Key or Obstacle to Economic Production." Dr. Hopper has made a study of this new development in production financing, and his treatment of this subject will be thought-provoking.

When final plans are concluded, further announcements will be made.

G.L.F. Eggs Move Fast In Nu-Way Promotion

ITHACA, N.Y.—Cooperative G.L.F. Exchange, Inc., reported the "biggest pullet egg sale since it started marketing eggs 16 years ago," in a recent issue of G.L.F. Week, publication of the cooperative.

The report said Nu-Way Markets, a grocery chain supplied with eggs through G.L.F., took advantage of a G.L.F. offer to promote small eggs. They introduced nearby fresh pullet eggs to consumers in western New York State as sale items.

During a three-day sale, the chain sold 30,000 doz. at 3 doz. for $1.

Nu-Way promoted the sale with ⅛-page newspaper advertisements and over radio and television, the publication reported.

BUYS GRAIN FIRM

ULMER, IOWA—Robert Gaffney has purchased the Ulmer Grain Co. from Lewis E. Eichhorn.

PRO-GEN
ARSANILIC ACID ADDITIVE
Get it in the Midwest from
Carroll Swanson Sales Co.
Box 1034, University Place Sta.
Tel. CR 9-8881 Des Moines 11, Iowa

Feed nutrients
BLOMFIELD-
SWANSON
MINNEAPOLIS

Ideas Must Be Followed

By Al P. Nelson

When Joe Brooks came to work that morning at half past seven an angry, red faced Pop Henley greeted him gruffly. "Joe, Milt Peters isn't here yet!"

Joe looked surprised. "Well, perhaps he's sick. Has anyone called the place where he rooms?"

"No, we haven't," Pop sputtered. "We've been busy takin' care of customers, Joe. We haven't got time to play nursemaid to a guy like Milt. I'm afraid, Joe, you'll have to dress him down again or just fire him."

"Why, what's the matter with him?" Joe asked in astonishment. "I thought Milt had reformed since I called him on the carpet for sleeping on feed sacks in the warehouse, and for waving at girls in the train from the feedmill."

"Your talk didn't do a bit of good, Joe. Milt's been coming to work five and ten minutes late just about every morning, and then he's practically dead on his feet for two or three hours until he wakes up. If that guy would stop chasin' around with redheads nights and get some sleep he'd be much better off."

Joe looked thoughtful. "Well, I didn't know he was late every day. I'm sorry to hear that. Despite his faults, I sort of like Milt and his cocky way toward life. And he does come up with some good merchandising ideas now and then."

"So do the rest of us," protested Pop Henley, "And we get to work on time which is something Milt doesn't do."

Smiley Johnson approached Joe and Pop. "Milt's coming now," he said. "He's about a half block away."

Milt Arrives

Pop and Joe went to the warehouse door and took a look. "Holy cow!" ejaculated Pop. "Look at him. He drags along like a man 80-years-old."

"He's got a large manila envelope under his arm," Joe observed. "I wonder why?"

"Don't be easy on him. Give him the works, just as you'd give any of the rest of us the works if we tried to get away with murder around here."

Joe's face looked grim. "I will," he said. "Just leave me alone with him."

So Pop retreated into the mixing room where he stood peeking around the corner, while Butterball Barlow had to run the grinders and mixers on a farmer's feed load.

When Milt got to the warehouse steps, his head was down and he yawned and shook himself like a dog coming out of water. "Man," he exclaimed as he saw Joe, "am I bushed!"

"So I observe," Joe commented drily. "It is past 7:30, Milt. We open at seven, you know."

"Wow, is it that late?" Milt grumbled. "Brr! I gotta get some more sleep nights. I just gotta."

"I guess all of us will second that motion," Joe said. "Milt, you are a bad example for the rest of the staff. You work shorter hours than they do by coming in late every day and in a pooped condition. How long do you think I can put up with such behavior?"

Milt looked at Joe with pain-filled, reddish eyes. "Joe, believe me, I'm not guilty of what you think—this time. I gotta real, legitimate excuse. Honest I have."

"Well, it had better be a dandy," Joe said. "The whole gang is getting down on you for abusing your privileges around here."

"I can see that," Milt commented drily. "I see Pop Henley grinning as he peeks out from the mixing room. He wants me to catch hell. But, Joe, the reason I'm so late this morning,

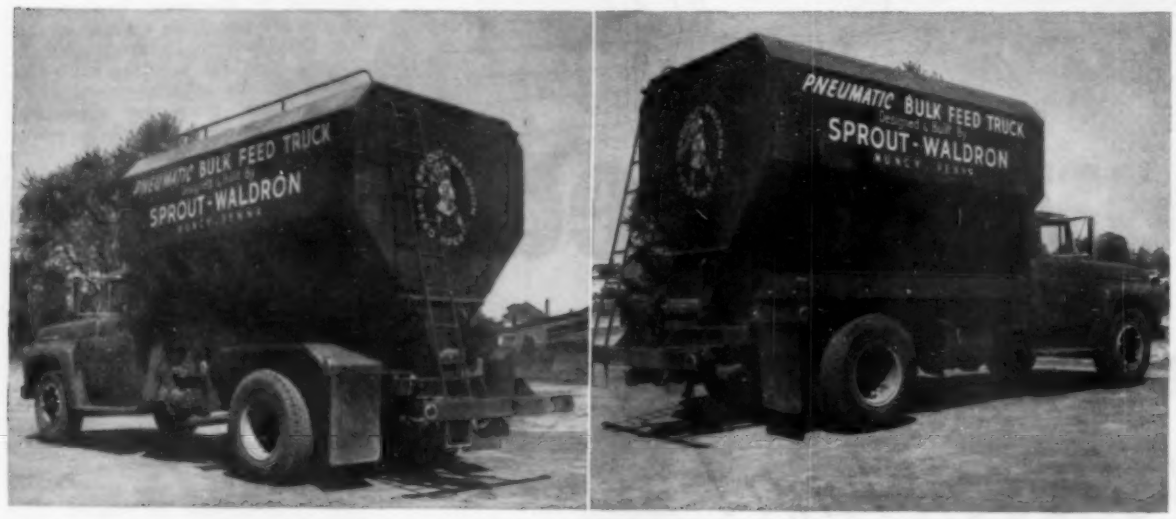
---

SW

SPROUT-WALDRON *Pointers*

for Mixing and Blending • Size Reduction
Size Classification • Bulk Materials Handling • Pelleting and Densifying

Published in the interest of better processing by Sprout, Waldron & Co., Inc., Muncy, Penna.



NEW SPROUT-WALDRON "ECONOMY" FEED PIPER®

This new, ruggedly-built, light weight "ECONOMY" bulk truck has been designed to give high performance at lowest possible initial and operating costs. A 9" screw conveyor with reinforced flights runs the full length of the body, assuring steady, reliable transfer. The 45° angle of repose affords excellent "flowability" of material and the full opening drop doors in all compartments eliminate the feed restriction that often occurs in competitive designs. The requirements of diverse materials are easily met by a step-pulley arrangement which provides a variety of speeds. No right angle drives are used, operation is trouble-free and maintenance requirements are low.

NEW FEED BULLETIN AVAILABLE

Sprout-Waldron has just released a new, condensed catalog of feed mill equipment. Write for your copy of Bulletin 206.

HERE ARE SOME DESIGN HIGHLIGHTS:

Construction: The bulk body is constructed of 14 gauge steel, while the center bulkheads are of 16 gauge steel.

Capacities: The standard three-compartment, 12-foot model, has a capacity of 504 cubic feet. Larger models are scaled dimensionally in the same proportions as the standard Feed Piper line. Unloading capacities range from 15 to 20 tons per hour.

Body Weight: 4,200 pounds.

Body Dimensions: Tank overall length is 14 feet, three inches. (This includes the 27 inch overhang beyond the body.) Overall width is 96 inches; and overall height, 11 feet, six and one-quarter inches. Height above frame to top of body is 94 and three-quarter inches, or an overall height above frame of 100 and one-quarter inches.

The "ECONOMY" model includes a positive 7-H rotary displacement blower of aluminum and cast iron construction, mounted on left front of body . . . a 14" x 15" airlock feeder with outboard bearings and rubber-tipped blades, mounted parallel to body at rear of truck; a compact power take-off . . . the patented self-loader when specified . . . and all necessary lights according to the I. C. C. lighting requirements, (except directional signals); rear bumper; mud flaps; three nine-foot lengths of flexible metal hose, complete with couplings; pressure gauge; tachometer; exterior hand throttle control; etc.

For the most economical, quality bulk truck on the market, get the facts on the new Sprout-Waldron "ECONOMY" Feed Piper. Ask for Advance Specification Sheet 203.

FP/108

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• When you sell the BEST chicks and can't afford to gamble on less protection

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The only antiseptically patented litter. Dustless—reduces risk of respiratory troubles. Absorbs chilling moisture, keeps chicks snug, dry and warm. Fire resistant. Pays for itself in chicks saved and rich fertilizer.

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THE Ray Ewing COMPANY

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New Pratts NEOVIM gets results!

HERE IS AN IMPORTANT NEW AID FOR TREATING . . .

1 **Chronic Respiratory Disease and Bluecomb in chickens**

2 **Infectious Sinusitis in turkeys**

3 **Bacterial Enteritis in hogs**

NEOVIM STIMULATES GROWTH, TOO!

In Neovim, Pratt has combined procaine penicillin and streptomycin at high levels with a *vitamin concentrate!* Neovim also stimulates feed intake and production during periods of stress and recuperation.

You can build your profits by recommending NEW PRATTS NEOVIM to your customers. See your Pratts representative or write for more information!

MAKE Pratts® PROVE IT!

Pratt Laboratories, Inc.
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FORTIFIED
FISH SOLUBLES
WITH MINIMUM 25% FISH GLANDULAR AND LIVER HYDROLYSATE ADDED
+ the Plus Factors
GUARANTEED "ALL YEAR" SUPPLY

Producers and Brokers
R. S. WILSON CO.
1206 MAPLE AVE. • LOS ANGELES 15, CALIF.

is that I have been developing a business idea for you."

"A business idea!" Joe looked at Milt's reddish eyes. "Oh, come now, I'm not that easily taken in."

Milt's Idea

Milt shrugged. "Nobody ever understands me, Joe, but honest I have a good heart. I'm thinking of you and your business, even when I'm out with my favorite redheads. Take last night, for instance—"

"Oh, that's the explanation, is it?"

Milt held up his hand. "Joe, ever since you taught us that we have to be thinking business, eating business and sleeping business, some of the joy has gone out of my life. No matter who I am with I keep thinking, 'What idea can I get out of this to boost Joe's business?'"

Joe tried not to smile, for he was pleased at this evidence of sales training benefit.

"Last night when I was out with Marilyn," Milt said, "she told me of something she saw on a billboard in southern Wisconsin when she came back from her vacation."

"What did she see?" Joe asked, a little suspicious of Milt's approach.

Milt sighed. "Well, she passed through Mount Horeb, west of Madison and she saw a billboard by a hardware man named Gilbertson."

"Yes?"

"On two corners of the billboard there were painted pictures of Gilbertson's head and the head of his wife. Each of the Gilbertsons was smiling."

Joe nodded, but said nothing.

"That started me thinking, Joe. Why can't we have a series of billboards along that line? One billboard can contain a picture of your smiling face, and copy below can tell how you are always glad to talk with farmers about their feeding problems."

Joe pursed his lips.

"Then," Milt went on, "succeeding billboards can show, for example, a picture of our mill 'the place for every farmer to get his feed supplies. Another billboard can show a picture of our mobile milling truck with inset pictures of the mugs of Molasses Moeller and Frenchy Le Fave. On other billboards you can show faces of the rest of our employes, if you want to. In that way farmers would get better acquainted with this mill and services and the personnel. We'd have billboards that would be eye catching, and that should mean more business."

An interested look spread over Joe's face. "So it might, Milt, but why should such thoughts make you look all dragged out this morning and late to work?"

Milt laughed. "Oh, after I got home from my date — about 2 a. m. — I started sketching rough ideas on those billboards. I got them in the envelope now. And Joe, it was almost five o'clock before I got to bed, so help me!"

Joe Agrees

He handed Joe the packet of sketches and the brown haired feed dealer glanced at them quickly. "Not bad, not bad," he said. "Maybe we can do something about this. But you'll have to make an apology to the boys at the sales training meeting next week."

"Why?"

Joe smiled. "You'll have to talk for 15 minutes on why you were late this morning, how you got this idea, how many hours you worked on sketching the billboards, and how this extra time makes up in part for the hours which you have been late during the past month."

Milt smiled. "I get the idea, Joe. Sure, I'll talk to the boys. I'll show 'em I'm not expectin' them to put in more time than I do for the same pay. I do night work for the business, too, and I oughta get credit for it."

"Night work whose results must show up in the cash register or in good will, new customers, etc.," emphasized Joe. "Remember, that's the only kind of night work around this feed business that I pay for. Other kinds of night work come off an employe's own account."

Allied Mills Adds Krumettes Dog Food

CHICAGO—The addition of Wayne Krumettes to the line of Wayne Dog Food has been announced by Wayne Switzer, director of the kennel and fur food division of Allied Mills, Inc., Chicago.

The new Krumettes are primarily the same formula as Wayne Drums and Blox, but are processed differently to give them their individual form.

A special extrusion (pressurizing) process and homogenization of ingredients forms the Krumettes into nuggets, and adds palatability, dextrinizes the starches for better digestion and increases the nutritional value of the new dog food, the announcement said.

Experimental feeding at the Wayne research kennel shows Krumettes to be excellent for either wet or dry feeding. It has proven itself in solving loose stool problems, the anouncement stated. Protein, fat and fiber are 25%, 7% and 5%, respectively.

Wayne Krumettes were made available to Wayne Feed dealers recently. They are packaged in 5, 25 and 50-lb. multiwall paper bags.

BUYS FEED FIRM

MADELIA, MINN. — Adams Feed Mill, Madelia, will be operated by Jim Adams, son of the owner, R. P. Adams, who has purchased the former Rasmussen Feed Mill here.

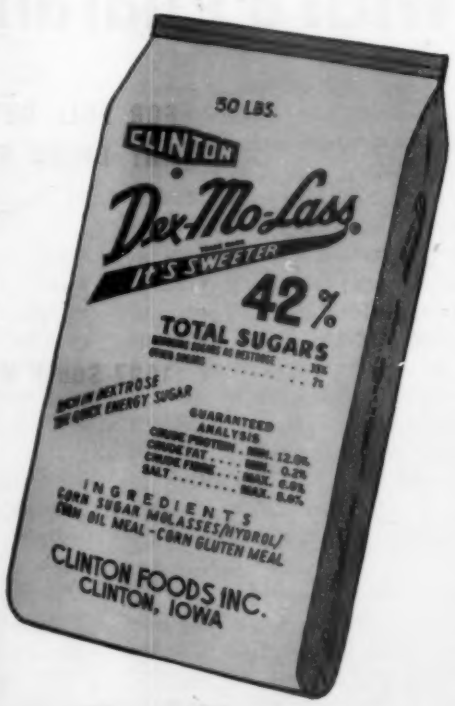
MORE PROFIT when your customers feed . . .

Dex-Mo-Lass® IT'S SWEETER 42% TOTAL SUGARS

Dex-Mo-Lass containing dextrose, the quick energy sugar, helps put animals and poultry in prime market condition. . . . Appetizing Dex-Mo-Lass gives animals the extra nourishment needed for faster gains.

Free-flowing Dex-Mo-Lass is convenient and easy to handle. Customers add it to rations without the difficulties of liquid molasses. Makes possible greater molasses concentration in your feeds.

Dex-Mo-Lass is a blend of corn sugar molasses (Hydrol), corn oil meal and corn gluten meal.



Quality products
FROM THE WORLD'S CORN CENTER
CLINTON
CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA

Egg Shell Quality
begins with
EGGSHELL BRAND
Oyster Shell

Poultrymen are being told the EGGSHELL BRAND story in advertisements and point-of-purchase displays wherever EGGSHELL BRAND Oyster Shell is sold.

Take advantage of this complete promotional program. Sell the really digestible, soft reef shell that has become the standard of the industry.

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DEPENDABLE MILL EQUIPMENT

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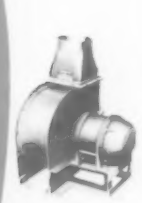
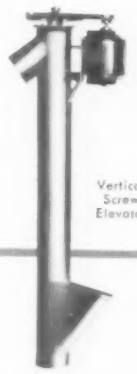


Grain Blower & Exhaust Fan

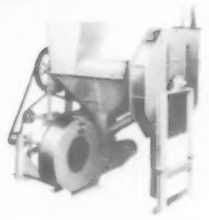


Vertical Screw Elevator

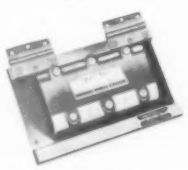
Cob Crusher for making Poultry Litter

Corn Cutter and Grader with Aspirator

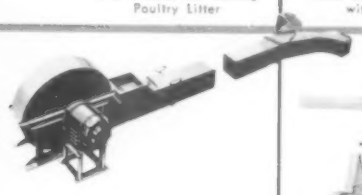
Vertical Feed Mixer ½ to 5 tons



Corn Sheller with blowers for grain and cobs



Magnetic Separator protects mill machinery

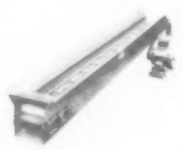


Forced Air Carloader with motor or belt drive

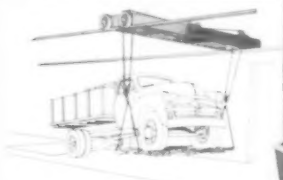
Remote Change Hammermill

Twin Molasses Mixer

Corn Scalper with or without air cleaner



Chain Drag in double and single geared types



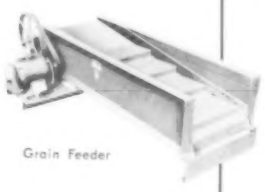
Electric Truck Hoist cuts handling costs

Pit Auger or Ear Corn Conveyor

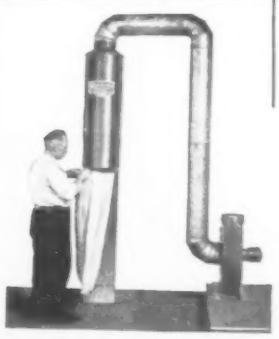
Combined Sheller-Cleaner

Instant Change Hammermills 12", 16", 20", 24" sizes

Finger Type Corn Crusher and Feed Regulator



Grain Feeder



Electric Bag Cleaner

The Duplex Mill & Manufacturing Company — Springfield, Ohio

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Yes, I'm interested in the KELLY DUPLEX machinery checked at the right. Please send me full information on these machines without any obligation.

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- ☐ Vertical Feed Mixer
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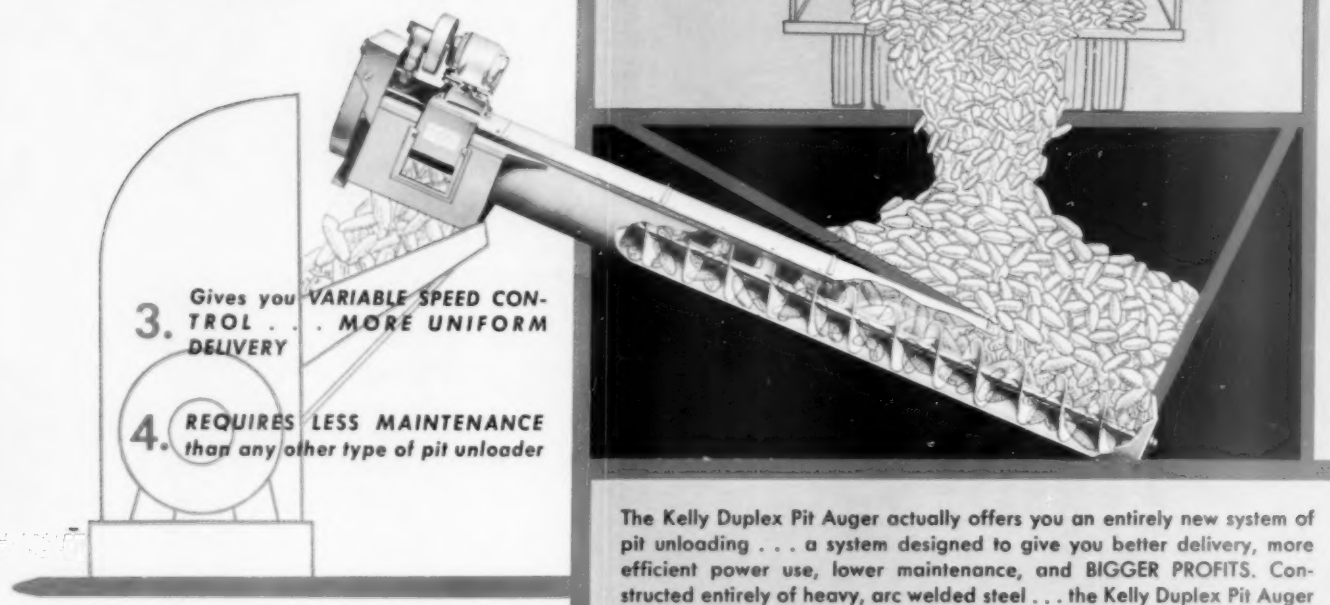
- ☐ Remote Change Hammermill
- ☐ Twin Molasses Mixer
- ☐ Vertical Screw Elevator
- ☐ Electric Truck Hoist
- ☐ Chain Drag
- ☐ Corn Sheller with Blowers
- ☐ Regular Corn Sheller
- ☐ Pitless Corn Sheller
- ☐ Combined Sheller-Cleaner
- ☐ Gyrating Cleaner
- ☐ Corn Scalper
- ☐ Cob Crusher
- ☐ Corn Cutter and Grader
- ☐ Corn Crusher—Regulator
- ☐ Bucket Elevator
- ☐ Electric Bag Cleaner
- ☐ Forced Air Carloader
- ☐ Magnetic Separator
- ☐ Grain Feeder
- ☐ Grain Blower
- ☐ Complete Line Catalog

KELLY DUPLEX PIT AUGER

(ear corn conveyor)

1. *Handles HUSKED and SNAPPED EAR CORN and all types of small grain*

2. *Assures you BIG CAPACITY at LOW HORSEPOWER*



3. *Gives you VARIABLE SPEED CONTROL . . . MORE UNIFORM DELIVERY*

4. *REQUIRES LESS MAINTENANCE than any other type of pit unloader*

Built to meet your needs, the Kelly Duplex Pit Auger can be furnished in any length with choice of 12", 14" or 16" diameter screw—can have any length hopper opening—and can be equipped with any size motor. Check and mail card today for full details.

a more efficient, more dependable system of pit unloading!

The Kelly Duplex Pit Auger actually offers you an entirely new system of pit unloading . . . a system designed to give you better delivery, more efficient power use, lower maintenance, and BIGGER PROFITS. Constructed entirely of heavy, arc welded steel . . . the Kelly Duplex Pit Auger will handle husked and snapped ear corn—as well as all types of small grain and free-flowing bulk materials. Drive can be at either end of the Pit Auger—making possible an open end discharge if desired. It's absolutely grain-tight . . . is smooth and noiseless in operation . . . and assures an even, uniform flow of material. Maintenance costs are low because there are fewer moving parts—and far less chance of breakdown—than with any other type of pit unloader.

FEATURES ***Include*** **an inspection door at the discharge end . . . an enclosed gear reducer and enclosed roller chain drive, both of which run in oil . . . and variable speed control for instant, positive adjustment of delivery rate.**

Inspection door at discharge end is standard equipment

Automatic motor control prevents overloading

An automatic electric control—connected to the motor of your Kelly Duplex Pit Auger and to the motor of your hammermill or corn sheller—gives complete, positive control over feeding. If the hammermill or corn sheller motor begins to show an overload due to excessively rapid feeding—the motor on the pit auger automatically stops until the load passes—then automatically starts again. Automatic motor control is available as optional equipment.

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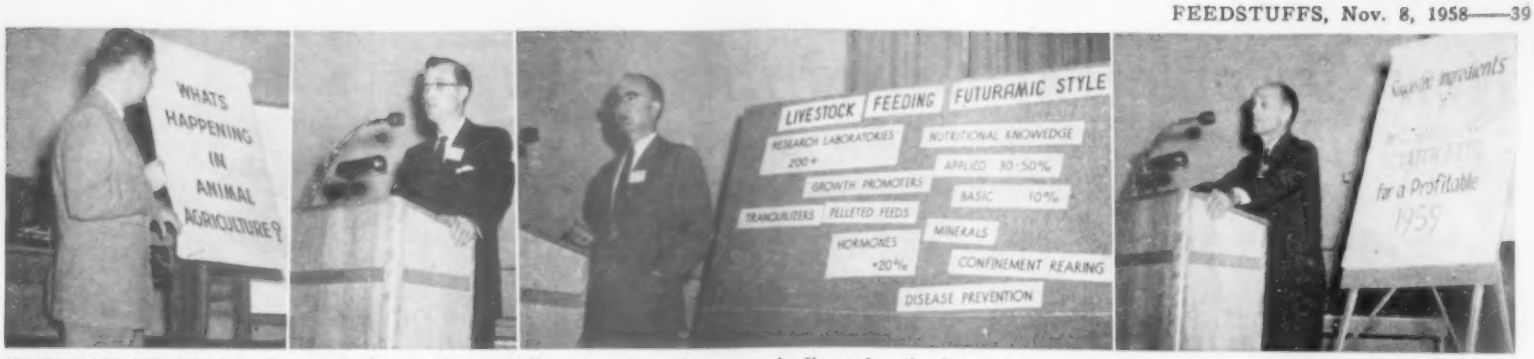

MICHIGAN SPEAKERS—Some of the speakers at the annual conference of the Michigan Grain & Feed Dealers Assn., held Oct. 16-17 at Michigan State University, are shown in these photos. In the first picture is J. F. McLimor, in charge of salesman and dealer training, Ralston Purina Co., St. Louis. Dr. Larry Boger, agricultural economist at Michigan State University, is discussing the farm picture for 1959 in the second picture. "Livestock Selling Futuramic Style" was the theme of Dr. J. A. Hoefer, department of animal husbandry, MSU, in the third picture. At far right is R. H. Slemmons, National Cash Register Co., Kalamazoo, Mich., discussing planning and merchandising for 1959.

St. Regis Quarterly Earnings Increase

NEW YORK—A general rise in business activity increased the earnings of St. Regis Paper Co. and its consolidated subsidiaries in the third quarter of 1958, although net income for the first nine months, at $12,732,541, was still below the comparable nine months of last year at $14,683,600. Third quarter earnings for this year were equal to 60¢ a share on St. Regis common stock, compared with 50¢ a share in the third quarter of 1957.

The company also showed an increase in income from the first quarter, at 41¢ a share, to 51¢ in the second quarter of 1958.

Earnings for the first nine months of 1958 on 8,158,105 shares of common stock were equal to $1.52 a share, compared with $1.75 on the 8,157,035 shares outstanding in the first nine months of 1957.

Sales in the first nine months of 1958 totaled $261,144,380, compared with $267,501,033 in the same period of last year.

Directors declared a dividend of 35¢ a share on common stock, payable Dec. 1 to stockholders of record Oct. 31. The board also declared a regular quarterly dividend of $1.10 a share on preferred stock, payable Jan. 1, 1959, to stockholders of record Dec. 5, 1958.

General Mills Appoints Three to Grain Posts

MINNEAPOLIS—Walter H. Mills, Jr., formerly manager of Montana grain operations for General Mills, Inc., has been named to the newly-created position of manager of General Mills grain merchandising and country elevator activities.

The announcement was made by J. S. Gage, vice president and director of grain operations for General Mills, who said that Mr. Mills would transfer to Minneapolis from Great Falls, Mont., to assume his new duties early in November.

In other appointments announced by Mr. Gage, T. R. Scully, currently grain buyer for the company's Buffalo, N.Y., and Duluth, Minn., operations, was named to succeed Mr. Mills at Great Falls as manager of Montana grain operations.

R. L. Schall, grain buyer for the company at Minneapolis, will assume the position of grain buyer for Buffalo and Duluth operations, Mr. Gage said.

Honeggers' Ships Trainload of Feed

FAIRBURY, ILL.—A trainload shipment of cattle feed sent from the Indianola, Iowa, plant of Honeggers' & Co., Inc., Fairbury, to dealers in the company's western division established a "first" for the plant recently.

The shipment was the first complete trainload sent by the plant to Honegger dealers in the division, which includes Iowa, Minnesota and Missouri.

Celebration of the achievement was noted by media and press representatives, from radio and television as well as midwest farm papers, who were invited by Ray Steele, vice president and general manager of the Indianola plant. Mr. Steele and officials from the company's headquarters were hosts for the day.

The group was taken on a tour of the Indianola mill and shown its manufacturing facilities and the new pelleting equipment for heavy molasses cattle feed which was installed recently. The group then witnessed the "sendoff" of the train and was later treated to a steak dinner.

Whitmoyer

CARB-O-SEP

is safe — even for BREEDERS

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New Viewpoints in the Nutrition of Layers

Looking at Current Knowledge of Layer Nutrition in the Light of Recent Developments

By Dr. F. W. Hill
Cornell University

The biological system for producing eggs consists of three components: the hen, the ration and the management program.

To a nutritionist, the hen in this system is an efficient, well organized biological machine, admirably suited to convert non-edible materials into a human food of outstanding nutritional value.

The ration represents the raw material requirement of the machine—the fuel supply to keep it operating, the repair parts to keep it in condition and the components for manufacturing the egg.

Placed in the proper environment with suitable controls of temperature, ventilation and light, and kept reasonably free from complications such as disease, the system can approach the biological equivalent of automation in achieving a steady output of the end product—eggs.

The job of the nutritionist is to determine the requirement of the machine for its raw materials, and the means of meeting these needs most efficiently with the feedstuffs available.

Three Dominant Trends

In recent years, three dominant trends have changed our concepts of feeding layers. They are: (1) the use of rations progressively higher in energy content, (2) the development of smaller strains of high production layers, and (3) the intensification of management methods leading to the use of larger flocks, cage equipment, automatic feeders, limited floor space, etc. It is interesting to look at the current knowledge of layer nutrition in the light of these developments.

It has been amply demonstrated that increasing the energy concentration of a layer ration reduces the feed requirement per dozen eggs (1-10). The mechanism underlying this effect is that the hen tends to eat the same amount of energy per day from rations which differ widely in energy concentration. The relationship involved is illustrated by data in Table 1 representing the combined results of several experiments at Cornell University. In these experiments, the hens were fed the respective rations over essentially a full production year, so the data shown are long-term averages.

Constant on Energy Basis

These data show clearly that under the conditions used (high production Leghorns, floor pen management, exposure to climatic changes) feed consumption rate on the average for the entire experimental period was remarkably constant on an energy basis. Only the very lowest energy level, which was noticeably inadequate for winter production, failed to be eaten at a rate consistent with the other rations. The rations high in energy content tended to support a higher rate of annual production, and also to produce slightly higher body weights even though rates of intake were essentially equicaloric. It is entirely possible that this is a reflection of higher metabolic efficiency of energy utilization associated with high energy levels, similar to results with fat supplemented rations fed to rats (11, 12) and chicks (13).

In nearly all of the experiments conducted to compare the effect of varying levels of energy on performance of layers, increased body weight has been associated with the higher efficiency produced by high energy levels. In these days of striving for trim waistlines, such a development is worth noting, even though the differences in body weight usually have not been large. The observations suggest a similarity to the familiar increase in body weight associated with middle age and sedentary habits in humans—and it is possible that this factor in layer nutrition will become of increasing importance as management systems progress toward greater congestion, more automatic equipment and less activity on the part of the hen.

Two recent reports have shown poorer results from supplementation of layer rations with fat (14, 15). The explanation for these observations which contrast sharply with many other reports is not known, but may involve type of fat, kind of layer, or the specific environment and its interactions. In any case, careful consideration is warranted.

Control of food intake is a fundamental problem of great interest which has been studied intensively with other species by many laboratories. No single theory is adequate to explain all of the factors involved, but it is quite clear that an intricate control mechanism exists within the animal body. It is also clear from work with other species that the young growing animal has a more precise control mechanism than does the adult; in other words, "normal" food intake geared to the needs of the animal body is achieved more easily by the young.

Table 2 illustrates the response of hens to a sudden change in feeding program as a measure of precision of food intake control. In this work caged layers which had been kept on a stock ration for several weeks were changed suddenly either to an extremely high energy, fat-supplemented ration or to a ration very low in energy content. The balance of metabolizable energy to protein was kept constant at 80:1, and each ration was fed to 8 replicate lots of 4 hens each.

The data show that during the first four weeks after the change had been instituted, the hens fed the high energy ration ate a much larger amount of energy than did the hens maintained on the stock ration or given the low energy ration. After the transition period, however, food intake on an energy basis was quite comparable. Production rate was high and unaffected by treatment, but weight gains paralleled energy intake. These observations suggest that a period of adjustment is necessary for the hen to regulate feed consumption to achieve essentially equivalent nutrition from widely different rations. A preconditioning effect of previous ration on short-term response to a new feeding program may be important, however.

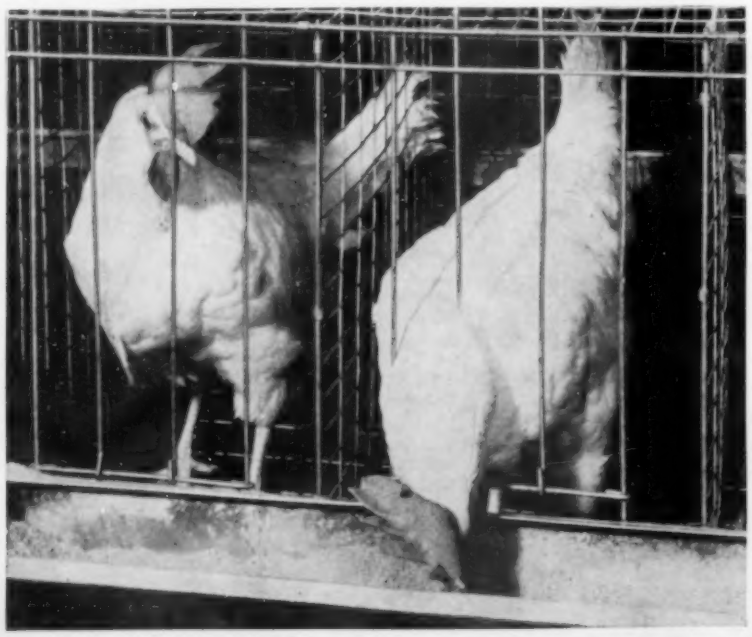
Controlled Feeding

Like most generalities, the principle that hens adjust feed intake in accordance with need is subject to severe limitations when applied to particular cases. A most interesting series of experiments has been conducted by Singsen and coworkers at the University of Connecticut (16) on the controlled feeding of heavy-breed layers. In this work it has been found that limiting the intake of a high energy ration to about 70 to 80% of what would normally be consumed resulted in lower mortality, and markedly reduced obesity without reducing rate of egg production. Similar performance was obtained by uncontrolled feeding of a diet low in energy concentration. These findings indicate that the heavy-breed type of layer is unable to control the rate of feed consumption satisfactorily when fed a ration high in energy concentration. The reason for this is not clear, but the findings are of critical significance.

Earlier studies of the effect of limiting feed intake have been done with high production Leghorns by Titus (17) and Heywang (18), both of whom found that egg production rate was quickly and markedly reduced by reduction in feed intake. The work of Heywang has been widely used (19) to illustrate the absence of a principle of diminishing returns in

Dr. F. W. Hill

AUTHOR—Dr. F. W. Hill went to the New York State College of Agriculture at Cornell University, Ithaca, N.Y., in 1948 after directing nutrition research for the Western Condensing Co., Appleton, Wis. He received his B.S. and M.S. degrees at Pennsylvania State University. Cornell awarded him a Ph.D. degree in 1944. At Cornell, where he is professor of poultry husbandry and animal nutrition, Dr. Hill conducts research on energy and vitamin requirements of poultry and teaches undergraduate and graduate students. He also has been active in feed dealers' conferences, the Cornell Nutrition Conference and other extension work with the feed industry. In 1957, Dr. Hill was awarded the research prize of the Poultry Science Assn. In 1958 he received the $1,000 award from the American Feed Manufacturers Assn. for distinctive research work in poultry nutrition. He is a member of several scientific and honorary societies, and his publications include both technical and popular papers on poultry nutrition.



Although nutritional studies with hens have been in progress since the earliest days of poultry nutrition work, the field represents a continuing challenge. To an increasing extent now, the hen is attracting the interest of researchers.

TABLE 1. Relation of energy level of layer ration to performance and energy consumption.

M. E. of ration	Performance data (11-month period) Egg production	Feed per dozen	Feed per 100 hen days	M. E. Cal. per hen day
Cal./lb.	%	lb.	lb.	Cal.
1070	65	5.7	31.0	322
1230	67	5.2	28.9	355
1370	68	4.6	25.8	353
1410	70	4.4	25.2	355
1450	71	4.2	24.6	356

TABLE 2. Response of caged layers to abrupt changes in metabolizable energy level of the ration.

Period after changing ration (weeks)	Ration fed after change* Control	High energy	Low energy
	Consumption (Cal./hen/day)		
1-2	332	412	335
3-4	357	390	351
5-12	353	377	339
	Egg production (per cent hen-day)		
1-2	87	86	81
3-4	87	89	89
5-12	83	81	82
	Weight gain (gm./hen)		
1-2	57	144	27
3-4	7	46	26
5-12	39	37	—2

*Control ration (1370 M. E. Cal./lb.) fed during preliminary period to all groups, and to control group during experiment. High energy ration had 1530 M. E. Cal./lb. (7.5% added fat); low energy ration had 1240 M. E. Cal./lb.; M. E./P ratio 80, calculated by dividing M. E. Calories per pound by per cent crude protein.

the relationship between egg production and feed consumption. He showed clearly that egg production rate declined about twice as fast as the rate of restriction of feed intake, with the result that efficiency rapidly worsened.

Apparent sharp and fundamental difference between meat type and production-type layers could well be an extreme expression of differences which exist among many strains to varying degrees. Is it possible that some strains of production-type hens are more prone to develop obesity than others? If so, is this tendency a result of an inaccurate "appestat" or is it failure of the control mechanism to operate well in a particular kind of feeding program?

Older Hens

Most of our information on the nutritive requirements of hens has come from short term trials. It is unusual for an experiment with layers to comprise more than one production year, and many studies have been conducted for considerably shorter periods of time. Obesity and degenerative diseases are problems associated generally with the latter part of life span in animal species, and it is perhaps because layers are not kept beyond a single production year in most commercial practice that we have not encountered problems associated with appetite control to any great extent.

With the advances that have been made in the breeding of laying stock, many strains are capable of sustained high egg production for months beyond a production year. With this factor and the high investment represented by the replacement pullet, trends have been started which may well argue for keeping layers for more than a single production season in commercial poultry practice of the future. If this becomes en established pattern in the industry, the nutrition of the hen will acquire a new look, and what are now infrequent problems of uncertain importance may become critical factors.

Protein Requirement

The usual approach in studying quantitative requirements of laying hens has been to establish minimum needs consistent with maximum performance, using as primary measures rate of egg production, efficiency of feed conversion, body weight maintenance and mortality. Very few objective measures of nutritional status of the hen aside from these outward manifestations have been attempted. Whether nutrient standards established with the criteria that have been employed are adequate for longer term nutrition and optimal well-being of the layer is not certain. Perhaps it is because these limited measures of nutritional adequacy are not sufficient that such widely different estimates of the protein requirement of layers have been found in experiments in different laboratories.

From extensive early work in this field it was generally concluded that a protein level of approximately 14-15% in all-mash rations for hens was necessary to meet the basic requirements for egg production (20). Since much of this work was done with rations of moderate energy content, it was reasonable to expect that higher protein levels would be necessary in modern high energy rations; furthermore, the trends toward higher production rate and smaller body size would also be expected to increase the protein requirement expressed as a percentage of the ration. In contrast to this expectation, however, in some extensive experiments with caged layers, protein levels of the order of 12-13% have been sufficient to obtain maximum production with rations quite high in energy value (21, 22, 23).

Recently it has been reported from Rutgers University (24) that a ration based on crude feedstuffs and containing 10.4% of crude protein supported egg production and weight maintenance equal to that obtained with a ration containing approximately 16% protein over a 6-month period. The formulation of the low protein ration was based on recent studies of amino acid requirements.

The range of potential improvement in efficiency of protein utilization for egg production over current commercial practice is substantial. The protein content of a 2-oz. egg and the daily maintenance needs of the hen for protein total about 9 grams and represent only about 7% of the normal daily feed consumption of a high producing layer. The conventional layer mash containing approximately 16% protein has therefore a biological efficiency of less than 50% in protein utilization. With highly di-

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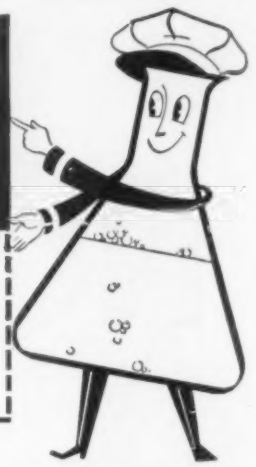

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1. Feed the first 10 days—then 3-5 days during, or immediately after, such stress factors as Newcastle disease or bronchitis vaccination, debeaking or housing pullets. **2.** Feed for the first 10 days and then for 3 days out of every week until birds are marketed. **3.** Feed continuously in case of disease outbreaks.

TURKEYS

Penicillin, absorbed into the bloodstream, affords maximum protection in all the tissues and organs of the body against the effects of gram-positive pathogens. Penicillin also is valuable in promoting economical weight gains in poults.

Streptomycin provides "crop-to-vent" protection against gram-negative organisms in the bird's intestinal tract. Slowly absorbed from the intestines, *Streptomycin does not interfere with the action of beneficial intestinal flora.*

LOW LEVEL—25 Gm./ton. For best results turkeys should be placed on low levels from hatching until they are 16-20 weeks of age. Low-level antibiotic rations will stimulate growth and improve feed efficiency. In the presence of disease, or on farms where the disease level is high, use rations containing 100 Gm. of PRO-STREP.

HIGH LEVEL—100 Gm./ton. At this level rations fortified with PRO-STREP will: treat bluecomb and infectious sinusitis; help maintain weight gains during outbreaks of these two diseases; prevent early mortality of poults due to organisms sensitive to either streptomycin or penicillin; help reduce losses following periods of stress such as vaccination, debeaking, chilling, moving, overheating; improve weight gains and feed efficiency in poults even in the presence of disease.

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gestible ingredients such as those which are normally used in poultry rations, a much higher efficiency should be possible, and the recent results of the Rutgers group clearly indicate that this can be achieved. Long term experiments leading to practical application will be of great interest.

Continuing Challenge

Although nutritional studies with hens have been in progress ever since the earliest days of poultry nutrition work, the field represents a continuing challenge. For many years nutrition of layers had little emphasis because the hen was not a convenient test animal for exploratory work. In contrast, because the chick is a convenient laboratory tool, a great deal of fundamental information ultimately useful in feeding practice has been obtained in the course of studies with chicks conducted for widely different purposes.

For some kinds of research, the hen is an especially useful subject. Problems associated with food intake, appetite control, obesity, etc., are of fundamental interest and, as indicated above, may be of major practical concern. To an increasing extent the hen is attracting the interest of researchers, and from previous history in the poultry nutrition field this is the most certain way to progress.

v v

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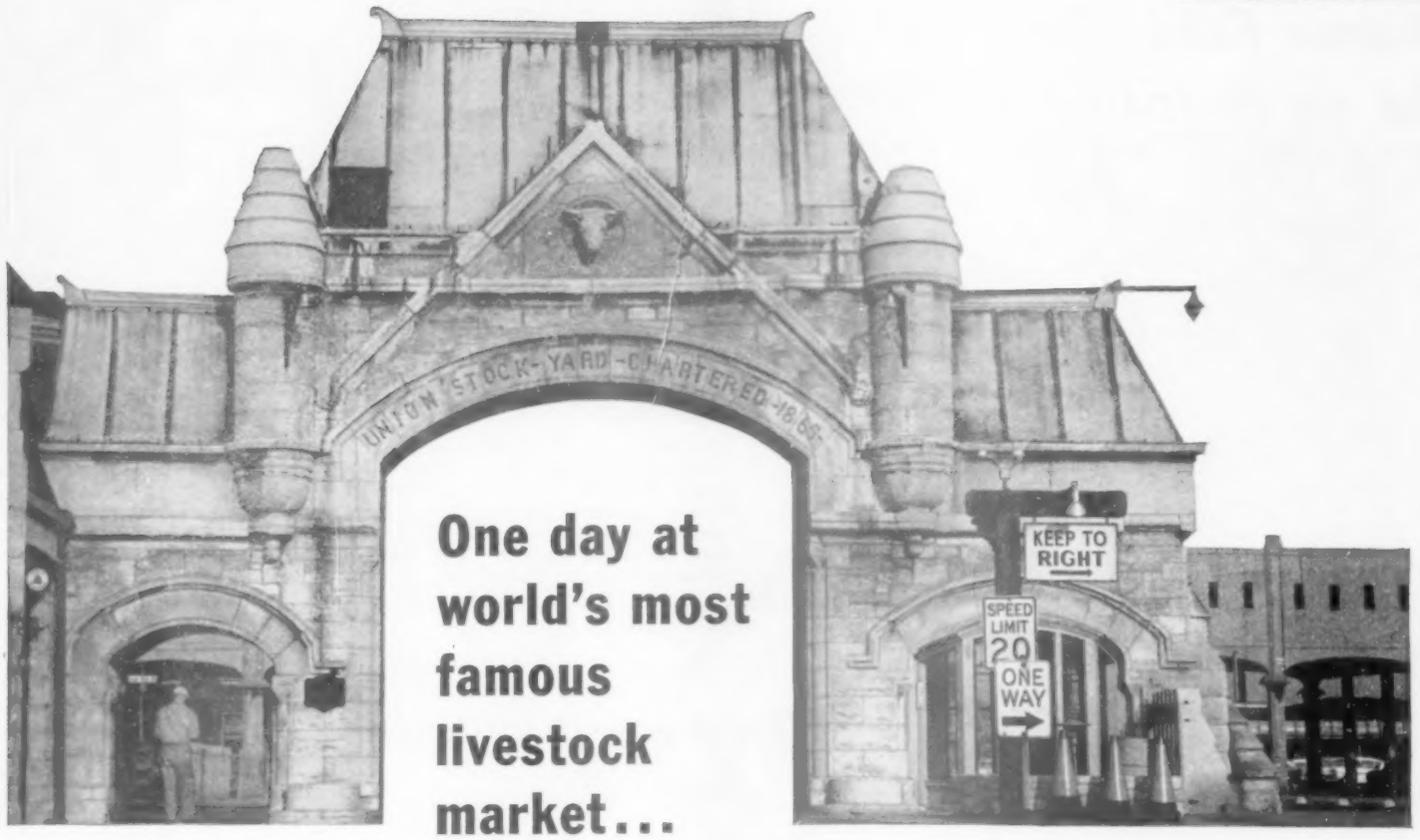


One day at world's most famous livestock market...

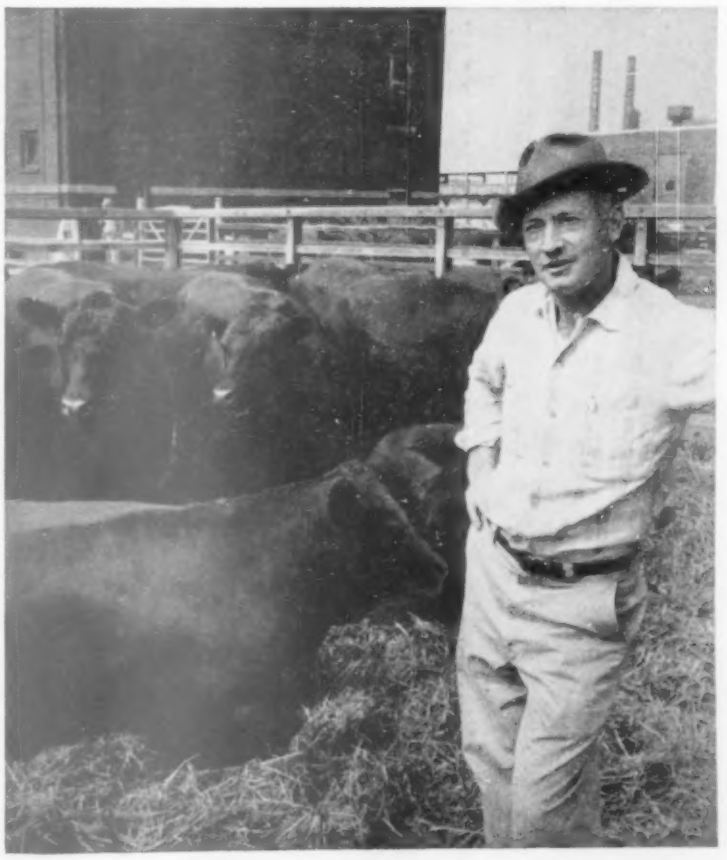
by Eugene S. Hahnel

Union Stock Yards, Chicago —This is the end of the line, the pay-off. Here's where buyer and seller butt heads. Here's where *price* is born!

We dropped by the yards one drizzly June morning to watch cattle sell. We especially wanted to talk to feeders who had fed 'Stilbosol.' How did they feel about it . . . a few minutes after their cattle sold? We visited them at their pens to find out.

Here's how 'Stilbosol'-fed cattle did...

Jerry Rogers, Sandwich, Ill. Jerry's 20 fine Angus steers topped the market at $32.00. They graded prime and the buyer estimated they'd dress 64%. "I don't think a person can afford to feed without it. I got ½ lb. more daily gain. Buyers like my cattle. They go East, and buyers always come back after more."



Donald Wright, Sugar Grove, Ill. Donald's all-heifer load brought $27.50, close to top for heifers that day. "This is my first year feeding 'Stilbosol' supplement. Had some yearlings that weren't gaining too well. Put them on 'Stilbosol' supplement and gains picked right up. Began using 'Stilbosol' to get more gain on less feed like your ads say. It works, too. It really can be the difference between profit and loss."

Lloyd Nelson, Boone, Iowa. "I'd hate to do without 'Stilbosol' in my supplement. It often makes the difference between profit and loss when margins are thin. Cattle are quieter, and put on about ¼ to ½ lb. extra daily gain. Cuts cost about 10 to 15%." Mr. Nelson estimated his cattle to average 1200 lbs. They averaged 1293 lbs. and sold near the top of the market.

Clarence Youngren, Harcourt, Iowa. "This was the first bunch of cattle I ever fed. I figured I'd better start off right and that seems to include using supplement with 'Stilbosol.' We got an increase in gain, better finish and lower cost of gain over what I expected." Clarence estimated his cattle at 1050 to 1075 pounds. The weight slip showed 1110 pounds.

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA

MAKERS OF **'Stilbosol'** (Diethylstilbestrol Premix, Lilly) • *Vitamin B12* • *Procaine-Penicillin-G*
'Hygromix' (*S. Hygroscopicus* Fermentation Products, Lilly)

Alabama Feed Men Hear Talks on Nutrition Findings

By E. L. McGRAW
Alabama Polytechnic Institute

AUBURN, ALA. — The second annual Alabama Nutritional Conference was held at Alabama Polytechnic Institute Oct. 23-24 with approximately 100 college and industry representatives attending.

Research information on dairy and beef cattle, poultry and hogs was presented. This information included such results as the following:

• Alfalfa hay is better than Coastal Bermudagrass hay as a roughage for dairy cattle.

• An antibiotic fed daily to young calves may stimulate growth 15 to 20% until they reach the age of six months.

• A low level feeding of a coccidiostatic drug during the first nine to ten weeks is the most widely used practice for control of coccidiosis in broilers.

• Polybor-3, a form of boron, fed to layers at the rate of 1 to 2 oz. per 100 lb. of ration, will control flies in manure.

• High vitamin levels in broiler rations will help control CRD, coccidiosis and fowl pox.

• The swine industry will have to increase the quality of its product and fight for its share of the housewife's food dollar or per capita pork consumption will continue to decrease as it has in the last ten years.

• Research shows increased gain on beef calves will pay for creep feeding, and there are added advantages, too.

ALABAMA CONFERENCE—Discussing the program at the recent Alabama Nutrition Conference at Alabama Polytechnic Institute, Auburn, are, left to right: Royce Wood, Decatur, president of the Alabama Feed Assn.; Dr. Coyt Wilson, associate director, API Agricultural Experiment Station; J. L. Lawson, associate director, API Extension Service, and John P. Weeks, Birmingham, vice president of the feed group. The conference was sponsored by the Alabama Feed Assn., API School of Agriculture and API Extension Service.

Following are summaries of conference talks and discussions:

DAIRY NUTRITION RESEARCH AT AUBURN—George E. Hawkins, Alabama Polytechnic Institute: During a study at API Agricultural Experiment Station, in which cows were fed 1 lb. of a 16% protein concentrate to each 3 lb. of milk, those on alfalfa hay produced 12.6% more milk than cows on Coastal Bermudagrass hay. However, with a ratio of 1 lb. of concentrates to 2 lb. of milk the production of cows on alfalfa hay and those on Coastal Bermudagrass hay was similar. During each study the cows received 10% more TDN than their estimated requirements. These data show that the net energy value of Coastal Bermudagrass is less when it supplies 67% of the TDN than when it supplies only 50%.

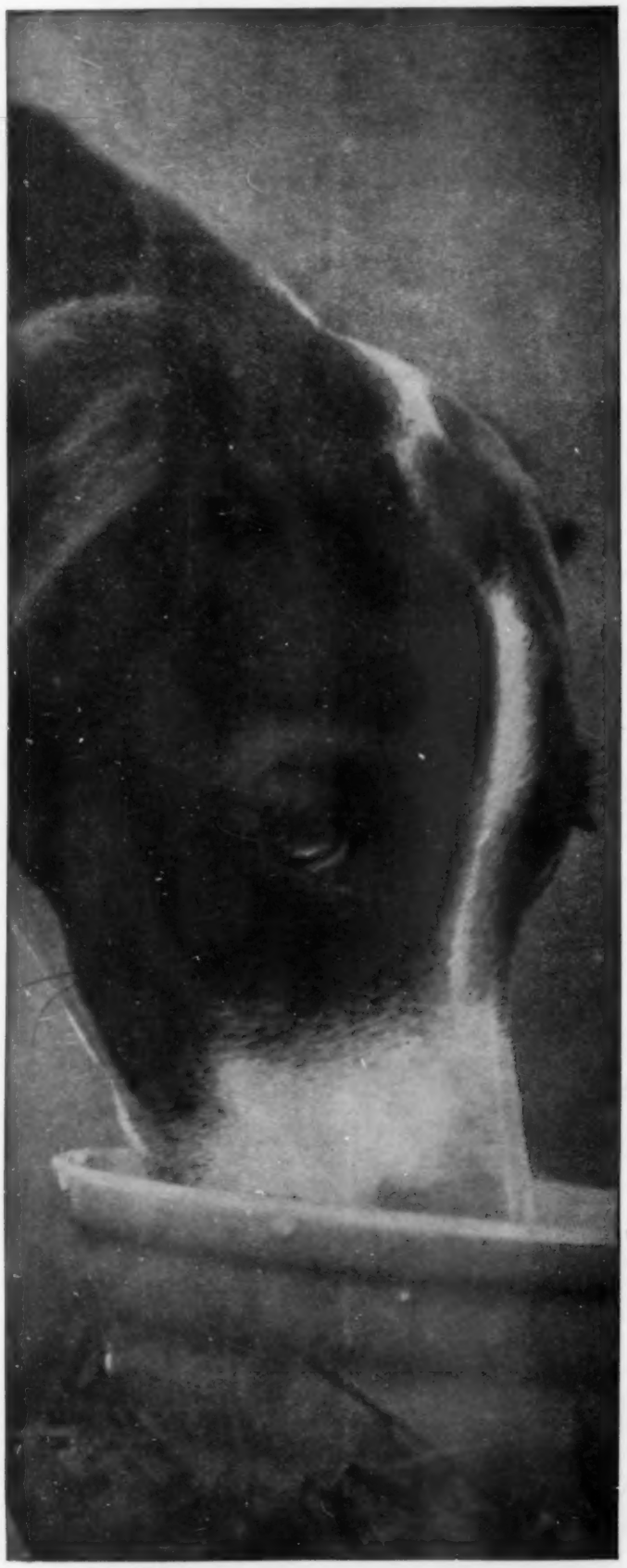
The crude fiber content of the Coastal Bermudagrass hays was higher than that of the alfalfa hays. Generally there is a decrease in net energy value of forages with increases in crude fiber content.

A study of activities in the rumen of cows fed alfalfa and Coastal Bermudagrass hay revealed that the acetic acid content of rumen liquor from cows fed Coastal Bermudagrass hay was high and propionic acid low. Production of a high proportion of acetic acid generally means a low net energy value in feeds.

Studies at other stations had shown that feeding of heat treated starchy feeds affected the proportion of volatile fatty acids produced in the rumen and the fat content of milk. Cows fed sericea typically produce less milk with a higher fat content than cows fed alfalfa. Adding stale bread or heated corn reduced the proportion of acetic acid and increased the propionic acid with concurrent reductions in percentage of butterfat in milk. This was accomplished when the cows were fed only 20% of their TDN as sericea hay. The response may be different when the forage supplies 70-80% of the TDN.

ANTIBIOTICS FOR MILKING COWS—K. M. Autrey, API: Numerous studies have shown that calf growth may be stimulated by feeding

(Turn to ALABAMA, page 107)



Quick way to improve your mixes . . .

G-AN-EN

adds vitamins, protein, minerals to balance dog diets . . . plus real nose appeal

When you add G-AN-EN in a 5% ratio to your mix formulas, you're adding flavor dogs can't resist . . . and extra food values dogs need for sturdy growth.

G-AN-EN is a concentration of all these ingredients in handy dry form: fresh-dried whole whey, dried buttermilk, cheese rinds, brewers dried yeast, vitamin A and vitamin D_2 feeding oil (stability-improved), niacin, sulphates of iron, zinc, copper, and manganese chloride.

ALL THESE EXTRA FOOD ELEMENTS ARE SUPPLIED BY G-AN-EN:

6 VITAMINS—*vitamins A, D_2, B_1, riboflavin, niacin (the anti-black-tongue factor), and pantothenic acid.*

6 MINERALS—*valuable milk minerals, calcium and phosphorus,* plus *the mineral salts of copper, iron, zinc and manganese chloride.*

MILK PROTEIN—*The milk protein in G-AN-EN contains all the essential amino acids in the milk proteins lactalbumin and casein.*

You'll find G-AN-EN is quick and easy to blend. It's packed in 50-lb. bags. Start today to improve your mixes this easy way.

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Assure even distribution of salt throughout your feeds. Use extra-free-flowing Morton Special Mixing Salt that won't cake or get lumpy even under adverse storage conditions.

For efficient production of formula feeds, you need salt that flows freely and evenly from storage and over conveyors to your mixers. It also must be free of lumps when it goes into your mixer to assure even distribution throughout the feeds.

Thanks to a recent Morton Salt research discovery, you now get this kind of free-flowing salt when you use Morton Special Mixing Salt. Both Morton Special Mixing Salt and Iodized Mixing Salt may be safely stored in bags or bulk for any reasonable length of time. They won't cake or lump—even when humidity is high. And you'll find that they flow more freely, after storage, than any salt you have ever used. Morton's nation-wide distribution enables you to get Morton Special Mixing Salt and Iodized Mixing Salt anywhere in the United States.

Morton also makes available Trace-Mineralized Mixing Salt containing: **Salt, Manganoferro Phosphate, Ferrous Carbonate, Copper Oxide, Cobalt Oxide, Cuprous Iodide and Zinc Oxide.**

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Grain Marketing System Breaking Down, Railroad Man Says

The orderly, open-and-above-board system of marketing grain and other agricultural commodities is in the process of breaking down, Clair M. Roddewig, Chicago, president of the Association of Western Railways, said in an address at the Nebraska Wheat Show recently.

The complete breakdown will come, Mr. Roddewig said, unless regulation is extended to all forms of for-hire transportation. Transportation of grain and agricultural products, part of which is moved under regulation by the railroads and part by unregulated motor vehicles and barges, cannot continue indefinitely without market demoralization.

Development of Regulations

The system of marketing grain under regulations imposed on the railroads by the Interstate Commerce Commission, Mr. Roddewig said, was developed over the years to provide orderly marketing procedure. Rate relationships have been developed so as to encourage the growth of agriculture and the processing of agricultural products throughout the U.S. The primary function of the relationships was to see that every producing area had access to a market.

"It is an open-and-above-board system with each and every producing area and milling operation having full knowledge of the transportation costs involved," Mr. Roddewig declared. "These rate relationships have been preserved to prevent undue discrimination between one producing area and another."

Each year an increasing volume of grain traffic is moving by motor vehicle, Mr. Roddewig continued. Motor carriers of agricultural products are exempt from federal regulation. They are not bound by rate relationships. They can make a deal on the spot as to what they will charge to move a load of grain. What they charge one week does not necessarily mean that the same charge will apply for a like load next week. The amount of the rate is known only to the motor vehicle operator and the shipper. The railroads can't do this.

Loss of System

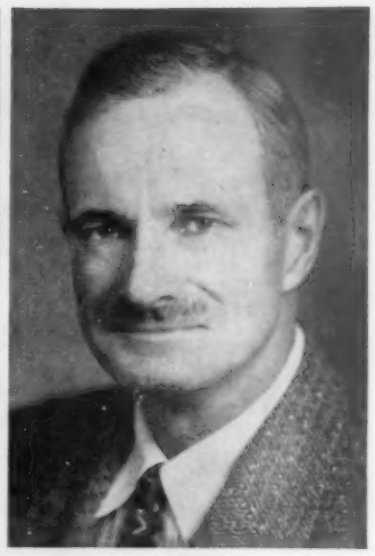
"The shipper may be picking up a few more cents on the bushel for grain, but he should realize," Mr. Roddewig said, "that when the volume of grain transported by motor vehicle reaches a certain point the orderly open-and-above-board marketing system, which you farmers and processors have always said is so important to your business, will go out of the window.

"Those engaged in the business are going to have to determine what value can be placed on regulated transportation in the orderly marketing of grain and whether the regulation of transportation has contributed to the stability of the grain business and the marketing of agricultural commodities."

If the answer is in the affirmative, Mr. Roddewig said, then it will become necessary for grain people to think in terms of extending regulation to all forms of for-hire transportation.

If this is not done, the railroads must be freed of regulation, Mr. Roddewig asserted and added that "to continue to hold the railroads subject to regulation while their competitors are exempt from regulation placed the railroads under an impossible competitive disadvantage—a situation where their hands are tied—where they can't fight to retain business or fight to regain business they have lost.

"The railroad industry cannot be expected to attain economic health and well-being so long as it is treated as the step-child in the competitive struggle for the transportation business of the nation."



Dr. Bill Tully

RETURNS TO LORET—Dr. Bill Tully has returned to his previous position of director of research for Loret Feed Mills, Chattanooga, Tenn. Dr. Tully was formerly with this same company for over two years. Dr. Tully has been closely connected with poultry production for 25 years, 20 years in feed manufacturing. Prior to this he spent 10 years in college work. In commercial work he has held such positions as director of research for Burrus Feed Mills, Ft. Worth; Sunset Feed & Grain Co., Buffalo, and others. He also did, for about five years, nutritional and consulting work for feed manufacturers.

TAKES NEW POSITION

EAGLE GROVE, IOWA—William Stock has resigned from the Eagle Grove Grain Co. to become manager of a milling and feed firm in Algona, Iowa.

Wenger

PACKAGED UNIT

Pellet Mills

100 HP Multi-Duty with 1 Liquid Conditioning Feeder

100 HP Multi-Duty with 2 Liquid Feeders

Complete Integration of Every Pelleting Component:

- Hard Pellet Mill
- Liquid Conditioning Feeder (1 or 2 liquids)
- Metered Flow Pump or Pumps
- Meter for each liquid
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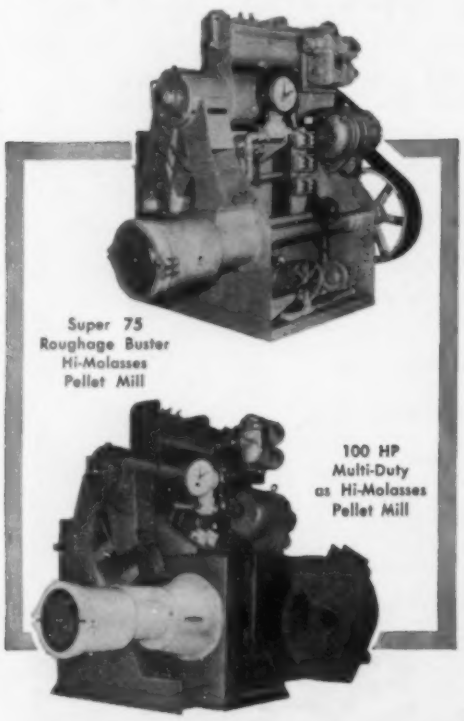
- Steam Conditioner
- Hi-Speed Mixer or Multi-Blender
- 1 Minute Changeover from pellets to Wenger-blended mash feeds
- Control Panel for entire pelleting system
- Automatic controls throughout
- Optional Hi-Molasses pellet extruder

Never satisfied with things as they have been, Wenger engineered the Multi-Duty for lowering costs and improving production.

50 HP Multi-Duty with Drawer type percentage Feeder (motorized variable speed drive optional)



Super 75 Roughage Buster Hi-Molasses Pellet Mill

100 HP Multi-Duty as Hi-Molasses Pellet Mill

Multi-Duty produces every major type of feed in demand today from a single packaged unit Pellet Mill

- Hard pellets (with or without liquids)
- Wengerblended mash feeds (1 or 2 liquids)
- Hi-Molasses pellets (optional)

Only WENGER Multi-Duty Offers such ECONOMIES

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- in man hours per ton of production
- in operations
- in liquid proportioning
- in floor space
- in installation costs
- in minimizing contamination hazards

Roller Chain Model Horizontal Pellet Coolers. Crumble Rolls and Scalper not shown here.

Write for complete information.

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Standard of the Industry for Liquid Feed Mixing, Pelleting and Cooling Equipment.

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EGGS
in the laying nests
EVERY DAY!
New HILLTOP'S IMPROVED FORMULA
K-M
NOW WITH VITAMIN "K"
Peps up layers who are in a slump because it improves feed conversion, increases water . . feed consumption.
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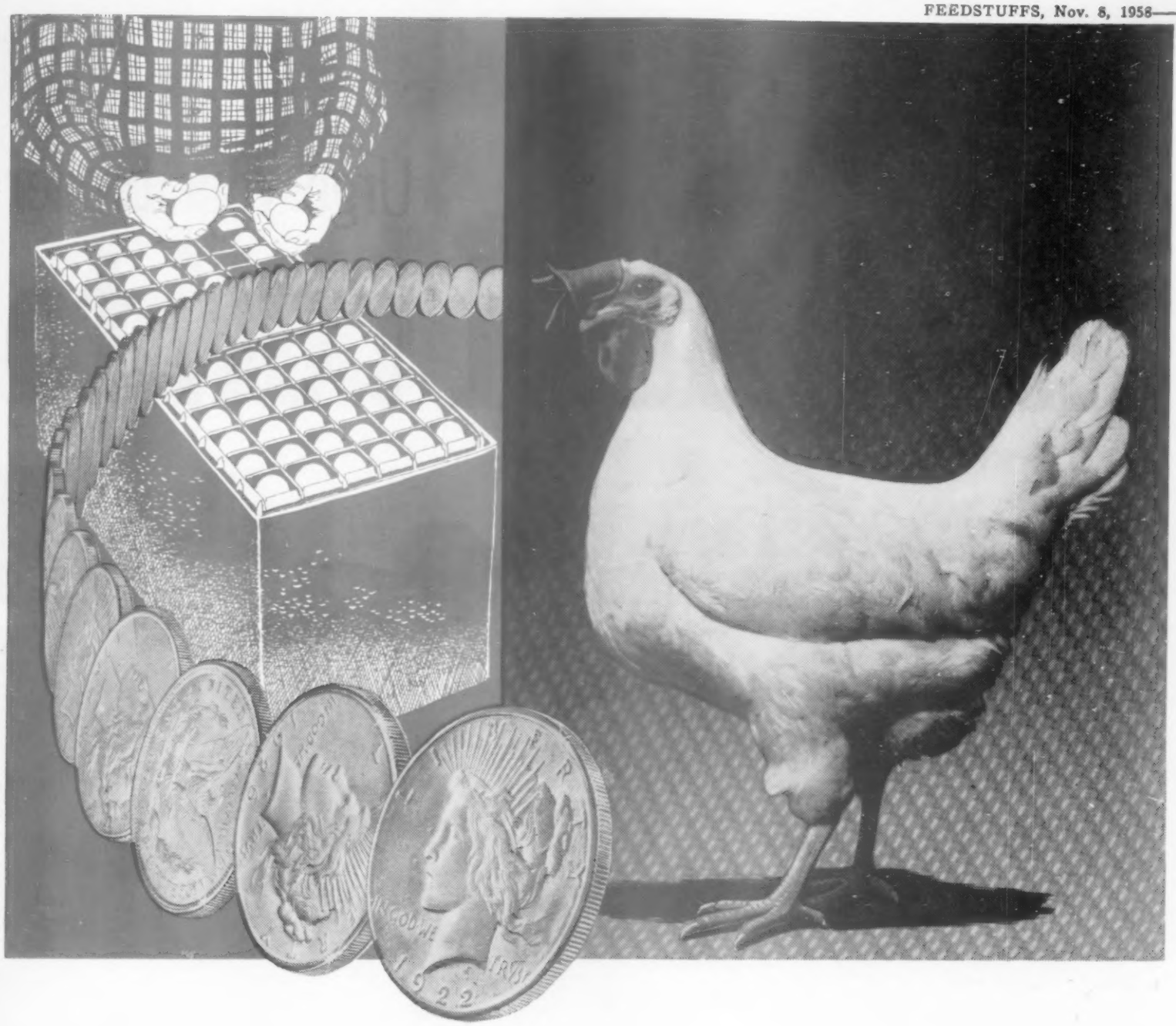

Hy-Line
PRECISION
GENETICS creates a harder-working layer

Earned 98¢ extra income per bird

Official tests prove it: In 1956-57 Random Sample Tests Hy-Line 934 Series white-egg layers available this year produced 98¢ more income over feed costs than the average of all competitive entries

Hy-Line superior laying ability, feed efficiency and livability combined to record the top profit picture of 1956-57 Random Sample Tests. Here are the income facts: Hy-Line white-egg layers produce 98¢ more income over feed costs than average of all competitive entries . . . they earned 80¢ more income than the average of 7 nationally sold birds.

Here's the income advantage of Hy-Line layers over each of the 7 other nationally sold chicks: 38¢, 49¢, 64¢, 91¢, 93¢, 96¢, $1.28.

Hy-Line profit performance is the pay-off of Precision Genetics.

Hy-Line birds are not the result of "chance matings." Hy-Line scientists blueprint desired characteristics and include them in the final bird just as an engineer designs mechanical performance.

Hy-Line, Tops in All Four Important Income Factors

- HIGH PRODUCTION
- LIVABILITY
- FEED EFFICIENCY
- LARGE WHITE EGGS

Precision Genetics combines inbreeding, hybridizing and blood typing . . . all the advanced tools of modern genetic science . . . to develop top-profit layers which can be reproduced by the millions for Hy-Line customers.

Bird after bird, year after year, you're money ahead when you choose and stick with Hy-Line white-egg layers, products of Precision Genetics.

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birds with a high-profit future

Hy-Line Poultry Farms, 1206 Mulberry St., Des Moines, Iowa

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Urge your broiler

"Start now to

ANIMAL FEED DEPARTMENT • AGRICULTURAL DIVISION

growers to

reduce throw-outs!"

INSPECTED FOR WHOLESOMENESS BY U.S. DEPARTMENT OF AGRICULTURE P-00

Winning this mark after January 1, 1959 will be a major concern of processors, broiler growers and – yes – feed manufacturers.

All will profit if every possible step is taken to minimize "throw-outs." This means, in addition to good sanitation, safeguarding health of broilers from the day they're hatched until they're marketed.

When your broiler feeds contain AUREOMYCIN® Chlortetracycline you have a potent weapon to protect your broiler growers and to safeguard processors.

Your good feeds, plus AUREOMYCIN, provide "health insurance" for two costly diseases: chronic respiratory disease and synovitis. These two diseases are the cause for lesions in the air sac, joints and breasts which result in the vast majority of market condemnations.

Research efforts, on the part of Cyanamid and of poultry pathologists across the country, have revealed that CRD and synovitis must be controlled by a *continuous, day-to-day program* to minimize lesions.

Continuous feeding of your good broiler feeds with high levels of AUREOMYCIN is your growers' best assurance of suppressing CRD and preventing synovitis.

Be sure your broiler feeds contain AUREOMYCIN. Urge your growers to give this feed the *first* day and *every* day! Urge them to "start *now* to reduce throw-outs!"

YOUR BRAND
Broiler Feed
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Increases in Truck Shipment of Grain In Minnesota Cited

MINNEAPOLIS — Substantial increases in truck shipment of grain from country elevators in Minnesota since 1946 were discussed by a guest speaker at a recent dinner meeting of the Minnesota Grain Shippers Assn. in Minneapolis.

The speaker, Dr. Reynold P. Dahl, department of agricultural economics at the University of Minnesota, presented the findings of a survey of 10% of Minnesota's country elevators. The purpose of the survey was to obtain data on the volume of grain shipped by country elevators from Oct. 1, 1956, to Sept. 30, 1957.

Dr. Dahl pointed out that the most important advantage of trucks over rail transportation is in rates, and that rail rates on grain have more than doubled since 1946. He said the increases in truck rates have probably been smaller. "Other factors such as better service, point-to-point operations which save time, and less trouble with adjustments for claims are also in favor of trucks," he declared.

Disadvantages Cited

The lack of transit privilege and the discounting of trucked grain at some terminals were cited in the survey as disadvantages for trucks. However, Dr. Dahl pointed out that these factors are not important when grain is trucked to river terminals for shipment down the Mississippi River. He said grain traffic on the river has increased in recent years, and that truck and water transportation often go hand-in-hand.

"Some individuals in the grain trade point out that the upsurge in trucking has reduced and will reduce further the grain receipts at terminal markets and grain exchanges," the speaker mentioned.

The survey showed that: Minnesota farmers sold 252 million bushels of grain during the 1956 crop year, and that about 40% of the grain purchased by elevators was shipped by truck to first destinations. Nearly 70% of all grain trucked from country elevators was corn. Soybeans accounted for almost 20% of all grain trucked from country elevators.

Sample Information

Information from a 10% sample of country elevators in connection with a North Central Regional Grain Marketing study of grain storage showed that trucked grain shipments amounted to 27% of the total grain purchases of Minnesota country elevators in the 1953 crop year, and that 35% of the 1955 purchases by elevators were shipped by truck.

Dr. Dahl said that part of the increase in truck shipments during the period under study probably was due to the recent drouth in states to the south of Minnesota. "Many elevator operators mentioned this as an important factor. It may be difficult to draw conclusions as to the permanency of the trend until data are obtained on the truck shipments for the 1957 crop year," he explained.

Robert R. Chappuis

PROMOTED—The promotion of Robert R. Chappuis to assistant plant manager at the Decatur, Indiana, plant of Central Soya Co., Inc., was recently announced. A graduate of the University of Michigan, Mr. Chappuis joined Central Soya in 1958 as personnel director of the Decatur plant. He was active in inter-collegiate athletics during college and, following All-American honors in football, played two seasons of professional football.

Artificial Lights Can't Fool Cows, Tests Show

FT. COLLINS, COLO.—Milk production can be increased in a number of ways, but artificial lighting is not one of them. Unlike their country cousins in the poultry house, dairy cows aren't fooled by the practice of extending daylight with electric lights, according to scientists at the Colorado State University Experiment Station.

Two six-week tests were conducted last winter to see what effects, if any, artificial lighting has on milk production or feed consumption. Lights were turned on at 6 p.m. and off at midnight, on again at 4 a.m. and off at 7 a.m.

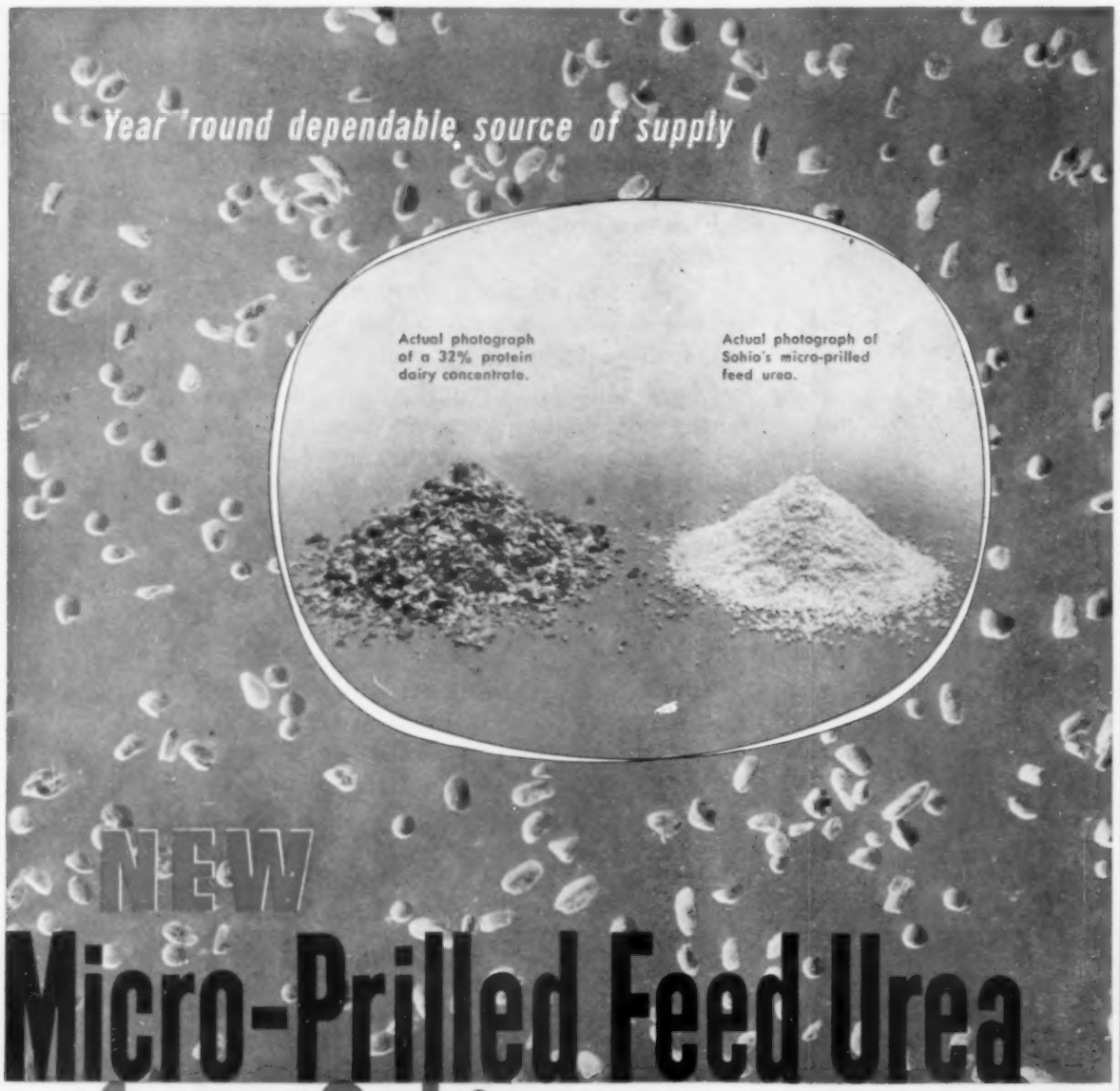
In this study, co-sponsored by the Colorado Farm Power Council, the researchers used two corrals, each containing 17 Holstein cows. Lights were installed in the loafing shed and the feeding area of one corral. The other enclosure remained dark all night.

A mixture of corn and alfalfa silage was fed every day at 5 p.m., and alfalfa hay was available at all times. Milk weights were recorded daily.

Comparison of the two lots showed no difference in either milk production or feed consumption. Both groups received the same amount of silage and consumed it in the same length of time.

Actually, the only apparent influence the lights had on the cows was to cause them to wake up earlier in the morning and line up before the door of the milking parlor.

Dr. Gerald Ward, associate dairy husbandman, and Ralph Hansen, assistant agricultural engineer, both with the CSU Experiment Station, were in charge of the research project. They were aided by James Sarchet, student assistant in the dairy department.


Year 'round dependable source of supply
Actual photograph of a 32% protein dairy concentrate.
Actual photograph of Sohio's micro-prilled feed urea.

NEW

Micro-Prilled Feed Urea from Sohio

Sized and shaped to mix... and stay mixed... in your feeds

Compare the size and shape of Sohio micro-prilled feed urea with ingredients of a 32% concentrate shown above. The similarity is the reason Sohio Feed Urea mixes readily . . . *and stays mixed.* Won't separate or settle out of your mixed feeds.

Sohio Feed Urea is first sized through a 30-mesh screen, over a 70-mesh screen . . . then coated and stored. It remains non-caking and free-flowing during shipping . . . is ready to mix right from the sack or handle in bulk.

Profit by formulating your ruminant feeds with Sohio Feed Urea. The minimum 262 percent protein equivalent (42%N) cuts formulation costs . . . and you benefit too from unmatched handling qualities and a year 'round dependable source of supply. Call the "Man from Sohio." He'll explain Sohio service, whether rail or truck delivery, or plant pickup at Lima.

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TURKEY FEED MANUFACTURERS

For top feed efficiency be sure your formulations contain sufficient Hydan trademark

STARTER RATION

Corn	45.0%	
Soybean oil meal	45.0%	
Fish meal	5.0%	
Misc.	5.0%	
	0.59%	required methionine*
	0.49%	actual methionine
	0.10%	methionine deficiency

Starter rations need sufficient added Methionine for top feed efficiency

Starter diets containing 30% protein are capable of supporting at least 900 calories of productive energy/lb. However, the combination shown at the left contains only 0.49% methionine, whereas the requirement is 0.59%. The deficiency of 0.10% can be economically corrected by the addition of "Hydan" at the rate of 2 lbs. per ton. Rapid early growth during this critical period requires a completely balanced protein.

GROWER RATION

Corn	61.5%	
Soybean oil meal	29.7%	
Fish meal	3.8%	
Misc.	5.0%	
	0.45%	required methionine*
	0.40%	actual methionine
	0.05%	methionine deficiency

Grower rations need sufficient added Methionine for top feed efficiency

Grower diets of approximately 23% protein will properly balance with energy content in the range of 920 to 1000 cal./lb. depending on stage of growth. The ingredient combination at the left is deficient in methionine by 0.05%—1 lb./ton. The use of "Hydan" to supplement feeds in this important growing period assures maximum rate of growth with high-efficiency diets.

FINISHER RATION

Corn	78.0%	
Soybean oil meal	14.5%	
Fish meal	2.5%	
Misc.	5.0%	
	0.31%	required methionine*
	0.285%	actual methionine
	0.025%	methionine deficiency

Finisher rations need sufficient added Methionine for top feed efficiency

Finisher diets containing a well-balanced protein can be formulated to a calorie/protein ratio of as high as 65/1. The 16% protein mixture shown at the left is only slightly deficient in methionine. For improved utilization of energy content during this period of heavy feed consumption, such mixtures should be supplemented with "Hydan" at the rate of ½ lb./ton.

*Based on a requirement of approximately 2% of protein.

FOR YOUR FORMULATION

Use Du Pont HYDAN . . . the new, lower-cost source of Methionine

"Hydan," the latest achievement of Du Pont research, which pioneered the methionine-energy concept, is a new source of methionine that contains 90% active ingredient and costs substantially less than methionine products previously available. Now the best way to obtain an effective protein in today's turkey rations—at the best possible cost—is to use new "Hydan" as your source of supplemental methionine activity.

"Hydan" is the latest result of Du Pont's continuing research in feedstuffs to help all turkey raisers to boost efficiency, cut costs, and thereby increase profits. Be sure that your feeds contain sufficient methionine. You can get lower-cost "Hydan" by contacting the Grasselli District Office nearest you.

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WYNNEWOOD (PHILA.), PA., 308 E. Lancaster Ave. • IN CANADA: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec

Helm Vertical Cooler

The Helm Cooler is designed 4' square with an "A" frame in the center which is approximately 12" for pellets, making a total of 3'. On either side is a 6" extension with louvers in this extension which guide small particles of material that come through the wire or perforated metal into the lower portion of the cooler.

The 6" extension is to eliminate wind from blowing the materials from either side of the cooler. This method eliminates the waste material falling on the floor. The "A" frame in the sides of the cooler are covered with wire or perforated metal. The sides and "A" frame are easily removed to replace the wire or the perforated metal.

The Model 100 cooler has approximately 9' of cooling in height, 4' in width, with 2' added for the hopper. The side walls of the cooler are straight down and do not have an angling offset which could interfere with the pellets or materials sliding downward into the feeder. The feeder is a small twin vibrating shaker controlled by a bindicator which is mounted in the hopper. The control gates hang downward in the end of the shaker frame and are held in position by the weight. When the shaker starts the material feeds under the gates. This arrangement eliminates changing the speed of the feeder. The shaker is so designed that it does not vibrate or shake the unit. It is very quiet and smooth in its operation.

For a lighter load capacity—Helm also manufactures the Model 60 Vertical Cooler.

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NEW SPRAYING DEVICE—This cattle sprayer uses aerosol bombs and will spray an average of 140 head of cattle with one filling of three 12-oz. containers. It costs only about $20 to build and shows promise for use with dairy cattle since it leaves no residue in milk. It was developed by Dr. Tien-Hsi Cheng of the Pennsylvania agricultural experiment station.

New Cattle Spraying Developed at Penn State University

Biting flies on cattle can be controlled by a new device using aerosol bombs, the latest development of Dr. Tien-Hsi Cheng, zoologist for the agricultural experiment station at Pennsylvania State University.

The device uses three aerosol bombs, activated by solenoid switches connected to a battery. Earlier Dr. Cheng developed a similar electric-eye controlled sprayer attached to a motor. The aerosol bombs are mounted on a doorway or chute through which the cattle pass. As the animal breaks an electric-eye circuit, the solenoid switches set off the aerosol bombs. The average spray time is 1½ seconds per animal.

Cost of building such a sprayer is about $20, a much lower figure than the cost of other sprayers used, Dr. Cheng claims. Cost of the spray used on each animal averages about 1½¢ per application less than the average costs for using other types of sprayers, he adds.

An average of 140 head of cattle can be sprayed with one set-up of three 12 oz. aerosol bombs, Dr. Cheng explains. Amount of spray used varies from ¼ to ½ oz. per animal, depending on the size of the spray nozzles used. By using small nozzles, Penn State researchers have sprayed as many as 225 cows with a set of three 12 oz. aerosol bombs.

Dr. Cheng's tests show that beef cattle gain faster on pasture if kept free of biting flies. In tests in Centre County, Pa., he found daily spraying increased the average rate of gain of beef cattle by ½ to ⅝ lb. per day.

The Penn State sprayers are designed to control horse, stable, and horn flies. Like Dr. Cheng's earlier motor sprayer, the aerosol bomb sprayer is consistently effective in controlling horn flies. Further studies on the control of horse and stable flies are in progress.

The new aerosol sprayer may prove successful with dairy cattle as well. Tests with sprays containing toxicants such as methoxychlor show no spray residue in milk. Research with other types of sprayers shows that some spray residue gets into milk. Dr. Cheng is cooperating with Dr. E. H. Frear and Henry F. Enos, Jr., of the department of agricultural and biological chemistry on further studies of toxicant residues in milk.

All parts of the animal are sprayed by the aerosols. About 100 head of cattle can be treated in 10 minutes, once the equipment is set up and the cattle become accustomed to its use. The sprayer avoids panic on the part of highly nervous cattle.

The effect of biting flies on milk production has been studied during the past two years in cooperation with Dr. E. M. Kesler of the Dairy Science Department at Penn State. Biting flies can reduce milk production from 20 to 40%.

Continued Large Grain Trade Seen at Buffalo

BUFFALO—Despite the loss of a large part of its grain export trade as a result of the St. Lawrence Seaway, Buffalo is likely to continue in a strong, pre-eminent position in the grain business because of the much more important and growing domestic market. This was the gist of an appraisal of this city's future grain trade presented Oct. 22 by Irving M. Hyland, vice president and regional manager of Cargill, Inc., in an address to the Buffalo Business Breakfast Club in Hotel Lafayette.

Because the seaway will be open for only eight months of the year, Buffalo "should continue to keep about 30%" of its present export volume, Mr. Hyland declared. Export shipments now amount to about 20% of Buffalo's grain business, he said.

Important Factor

A more important factor in Buffalo's future as a grain center, which now employs 6,500 workers who draw wages and salaries of more than $35 million annually, is the "well-anchored" growth of the domestic market which Buffalo serves, Mr. Hyland said.

This market amounts to "more than a third of the population in this country," Mr. Hyland said, and the market is growing at the rate of about 8% a year.

Mr. Hyland emphasized that Buffalo will have a big advantage in that it, along with other Lake Erie ports, will be able to make full use of the seaway before other Great Lakes ports. "We know that connecting channels west of Lake Erie will not be ready for seaway-draft ships until 1960 or 1961," he declared.

"The large import ore carriers from Labrador are going to be interested in the fastest turn-around possible. The demand for ore at Lake Erie ports is huge. Therefore, some of them will be geographically available for fast-loading backhauls of grain after they discharge their ore cargoes. It will take ore carriers several days and many dollars to deadhead into the western lakes for grain cargo."

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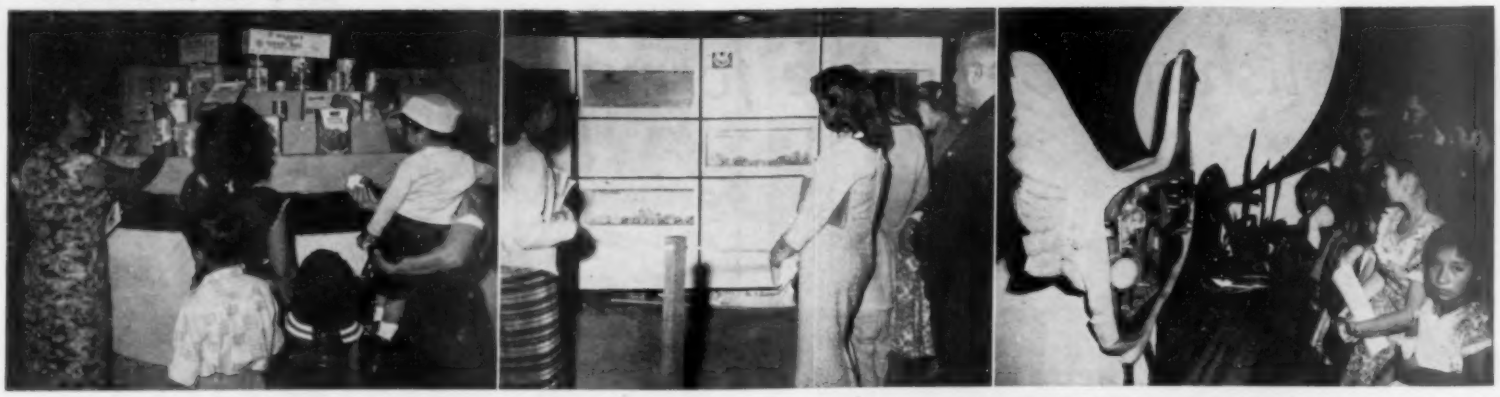
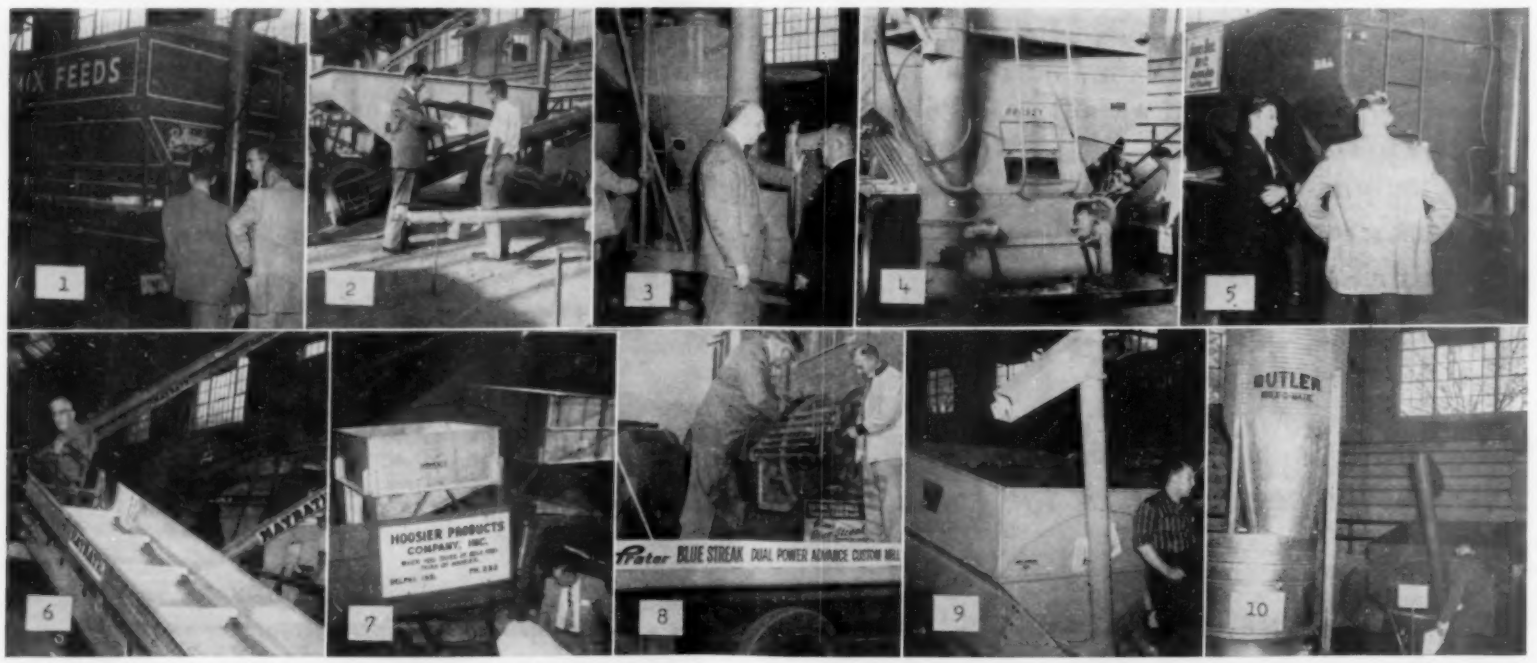


USDA MEXICAN EXHIBIT—Visitors to the U.S. Department of Agriculture exhibit at the 11th World's Poultry Congress in Mexico City, had a chance to view some of the brand names of U.S. poultry processors (left). Fifty-five U.S. firms exhibited at the Congress. In the center picture, specially built glass-front incubators attracted many spectators, young and old, to watch the hatching processes. A commercial hatchery near Mexico City brought hatching eggs and removed the hatched chicks daily. At right, the USDA's talking hen was one of the popular attractions. She described in Spanish how and why egg production had improved in the U.S. The exhibit was designed to show the development of the U.S. poultry industry, including the development of modern feeds.

Camera Views of the News

NEW OFFICERS—Shown are the officers and members of the board of directors of Poultry Industries of Louisiana, Inc., elected recently at the group's meeting in New Orleans. Seated (left to right) are: Charles Ivey, Independence; Clyde Ingram, Louisiana State University, executive secretary-treasurer; Truett Sledge, Hammond, president, and Stella Jones, Louisiana State, assisting secretary. Standing (left to right) are: Dan Durham, Hammond; M. B. Hunter, Coushatta; C. B. Sledge, Hammond; M. L. Laing, Alexandria; Cliff Conine, Natchitoches; Dr. A. B. Watts, Louisiana State; W. L. Hunter, Coushatta; J. H. Johnson, Alexandria, vice president; J. R. Heflin, Shreveport, and Jim Hedrick, Shreveport. New board members not in the picture are Charles O'Neil, New Orleans; J. Spencer Jones, Hammond; Jess Loyd, Shreveport, and R. J. C. Tricou, Jr., Hammond.

ATTEND KENT TRAINING SCHOOL—Kent dealers and dealer personnel participated in a training school on feeds and nutrition given by members of the educational and scientific staff of Kent Feeds at its Muscatine, Iowa, facilities recently. Pictured is the group which attended the school. They are (left to right): Front row—Leon Fuller, Garringer Feed Service, Ladora, Iowa; Glen Canny, Leonard's Hatchery, Osage, Iowa. Second row—Robert Taylor, Buss Feed Service, Laurel, Neb.; Robert Hoogerwerf, Prophetstown (Ill.) Feed Mill; Elmer Kramer, Brinkman & Pessman Lumber Yard, Fulton, Ill.; Roy Fread, Farmers Cooperative Co., Winfield, Iowa. Third row—Daniel Pick, Farmers Cooperative, Remsen, Iowa; Dale Hochstetler, Kent Feeds, Inc., Wellman, Iowa; Dean Maiden, Ryan Grain Co., Sioux Rapids, Iowa; Roy Royer, Canton (Ill.) Feed & Farm Supply; Virgil Finch, Farmers Elevator Co., Sciota, Ill.; Ed Cox, Gorham & Cox Mobile Milling, Douglas, Ill. Fourth row—Pete Hollender, Kanaranzi (Minn.) Elevator Co.; Richard Strawhacker, Oakville (Iowa) Feed & Grain; Virgil Buss, Buss Feed Service, Laurel, Neb.; Dale Lynn, Farmers Cooperative, Marcus, Iowa; Alvin Heun, Brinkman & Pessman Lumber Yard, Fulton, Ill.



BULK FEED HANDLING EQUIPMENT—One of the highlights of the annual meeting of the Michigan Grain & Feed Dealers Assn. recently at Michigan State University was the exhibit of bulk feed handling equipment set up in the livestock pavilion. The exhibit included a wide range of equipment used by feed mills and on feeders' farms. The exhibits shown here (by number) are as follows: (1) A Bulkanizer bulk feed truck shown by McLaughlin, Ward & Co., Jackson, Mich., and McMillen Feed Mills, Ft. Wayne, Ind. The Bulkanizer is manufactured by North American Manufacturing Co., Sioux City, Iowa. (2) American Planter Co., Burr Oak, Mich., showed a line which included a 6-10 gravity box with auger attachment; a 10-in. portable grain auger; automatic livestock feeding system; "U" trough distributing auger and a "Model" bulk storage bin. (3) Earl R. Wennlund, Monticello, Ind., and A. J. Sheard, Antwerp, Ohio, displayed a Grain-Vayor, manufactured by the portable division of Myers-Sherman Co., Streator, Ill. (4) A Dorsey Bulkmaster was shown by John W. Lingard Sales Co., Albion, Mich. The Dorsey unit is manufactured by Dorsey Trailers, Elba, Ala. (5) A Gaddis Bros. Pak-Master bulk feed unit was exhibited by Mill Equipment Sales, Hillsdale, Mich. (6) Bert Howard, Inc., Lansing, Mich., showed a line of Mayrath conveyors and augers. (7) Hoosier Products Co., Inc., Delphi, Ind., displayed a dump-type truck with floor auger and overhead auger. (8) George Thomas (left), Prater Pulverizer Co., Chicago, shows a Prater Blue Streak custom mill to Herschel Haradine, Harvey's Milling Co., Carson City, Mich. (9) Duane Valkner, Climax, Mich., representing Wonser Supply Co., Battle Creek, Mich., showed a Helix bulk unit manufactured by the Helix Corp., Crown Point, Mich. (10) Farm Bureau Services, Lansing, Mich., exhibited a Butler bulk feed tank, a Unico 50-bu. hog feeder and a Unico Cari-Mix auger box.

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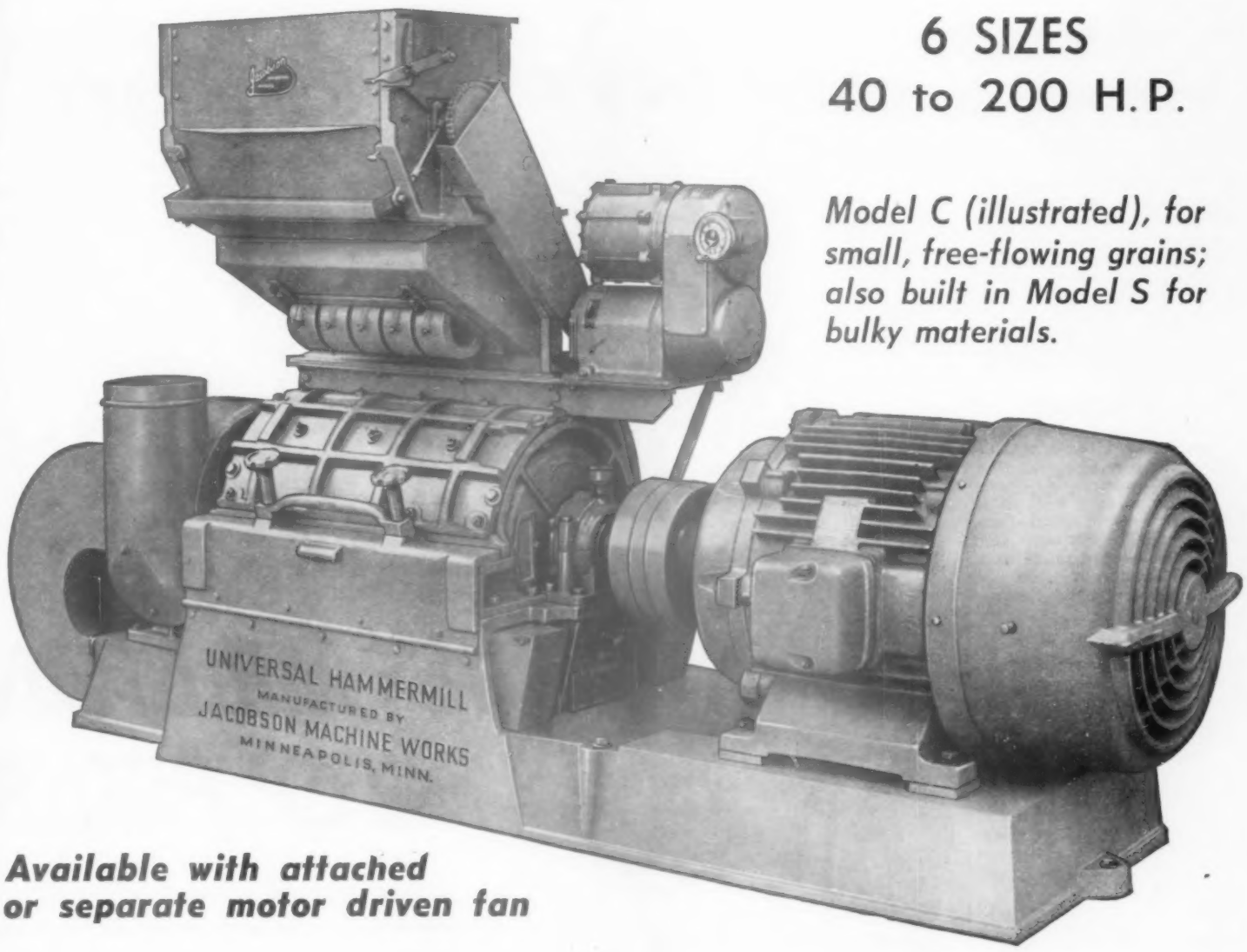

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MERCHANDISING BULK FEED

"Bulk feed, so far as the feed dealer and the livestock and poultry man are concerned, is now a reality—not a trend"

By Stanley Odle
Allied Mills, Inc.

EDITOR'S NOTE: Stanley Odle, district sales manager for Allied Mills, Inc., Ft. Wayne, Ind., a speaker at the recent conference of the Michigan Grain & Feed Dealers Assn. at East Lansing, said the feed dealer must now think of bulk feed as a reality and must be prepared for it. He mentioned several needs and responsibilities which must be considered first by the feed dealer as basic requirements for the operation of a sound business, and then he reported on a survey of Michigan feed dealers regarding their outlook on bulk feeding. The conclusions drawn from the survey are of interest to dealers and others connected with the feed industry. The accompanying article is from Mr. Odle's address.

It may seem a strange and rather drastic statement in this day and age with the progress that we have made and are making in the feed industry, but it is, nevertheless, true that we must continue to compete aggressively or we will soon become a casualty in the industry.

Changing times, such as vast consumer credit, heavier taxes and inflation, moreover, are affecting the habits of our increasing population. In a competitive atmosphere, there is no standing still or coasting. So, like it or not, change is an essential part of our progress.

Our feed industry has a great responsibility in the future of the livestock and poultry industry. I am sure it will accept this responsibility even though it may require many changes which may appear to be drastic changes at times. Changes must come. They must be based on accurate knowledge and sound judgment with an eye to the future well being of the agriculture industry as a whole.

One of the biggest changes that has come about in our industry so far as feed distribution is concerned in many years is that of bulk feed. For the past 5 to 10 years we have been content to refer to bulk feeds as a trend. However, I do not feel that we can consider bulk feeds a trend any longer. Bulk feed so far as the feed dealer and the livestock and poultryman are concerned is now a definite reality—not a trend.

Other Considerations

A few responsibilities and needs of the feed dealer must be examined before he even considers going into bulk feeds.

The primary function of a feed dealer is service—service in the form of local grinding and mixing equipment, inventories of certain needed products, service in the form of information, poultry and livestock management assistance, credit, storage facilities and a host of other activities expected by his customers.

Today, customers like prompt service. They are businessmen, and their time is valuable. They, themselves, have thousands of dollars invested in labor and time-saving equipment, and, without a doubt, their time will become even more precious in the future.

Today, the feed dealer must be as modern as his business will possibly permit, and as efficient as is necessary to remain competitive. Also, every employee must be conscious of the importance of service to customers. This can come about only by educating employees to the importance of service to the customer.

Where custom grinding and mixing services are offered—and it is almost a necessity today—the mill's equipment should include grain dumping, elevating and conveying facilities that promote a smooth and fast operation. The feed mill has many mixing formulas for today's custom mixing, and its grinding and mixing facilities should be geared to produce such formulas in a quality manner. Equipment for adding molasses and other liquids should be seriously considered if it is not already in the operations.

Inventory

The matter of inventory is another very important service to our customer. The tremendous increase in the use of antibiotics, drugs and other medicants in feeds has brought about an inventory challenge for the entire feed industry.

There are two basic inventory principles that will hold true regardless

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THESE PROFIT-MAKING PRODUCTS NOW MADE AND SOLD BY KRAFT

of what will come in the future. Unstocked goods cannot be sold, and overstocked goods can seldom be sold at the desired or the necessary margin of profit. Dealers who handle complete lines of feed and farm supplies and livestock and poultry health products, seeds, fertilizers and any other needed service items will be in a better position to attract and hold the fewer, but larger, customers of tomorrow than those who are more limited in these services. Careful and constant studies of the changes coming about in the dealer's feeding area will help determine the other types of services needed to be considered in the business operation of the future.

Knowledge of Products

It has always been my firm belief that the feed dealer must be well informed on many subjects. He must keep in mind that Mr. Farmer is more apt to come to him for guidance and direction on feeding problems than to go to the county agent, the local agriculture teacher or even to his state agricultural university. The feed dealer must know the advantage of every product that he sells before he can tell and sell them to his customers. In our own organization we often remind ourselves that we must have the aggressiveness to see them, the knowledge to tell them and the ability to sell them—see 'em, tell 'em sell 'em.

Another important service entering into our industry today is that of market information and buying and selling trends. Also, growing in importance is business and personnel management know-how.

We can also render service as a result of our ability to do a good job of merchandising and advertising and sound public relations.

Local advertising, whether it be local newspaper, radio or even television, can be sound merchandising. With customers becoming fewer, it is conceivable that more emphasis will be placed on direct mail or, mind you, even direct telephone selling, which will cause us to give a great deal more consideration to selection of prospects than has been done in the past.

Such promotions as "off the car" sales or any other such promotion that can be offered that will reduce the dealer's handling cost and which will allow price savings to the customer will certainly continue to be sound promotion techniques.

Survey

Approximately 45 days ago, a farm market research organization decided to try to learn from the Michigan feed dealers what their feeling was concerning their present and future plans on sales and merchandising of feed and also to learn something more about their feelings on bulk feed distribution.

This research organization mailed a rather comprehensive questionnaire to more than 350 Michigan feed dealers—some to every county in the state. Replies from 27% of these dealers, when tabulated and summarized, gave some very pertinent information in regard to the present as well as the future trends in sales and merchandising and the question of bulk feed.

BULK DISCUSSION—Stanley Odle, district sales manager for Allied Mills, Inc., Ft. Wayne, Ind., is shown here addressing the annual conference of the Michigan Grain & Feed Dealers Assn. on the subject of bulk

1. Length of time in the feed business. The average Michigan dealer has been in the feed business for about 18 years. Almost three fourths (74%) of the dealers who have been in the business five years or more still handle the same brand or brands of feed as they did five years ago.

This definitely points out that the feed trade in Michigan is very conservative. Loyalty to feed brands is strong — manufacturer-retailer relations must be fairly strong.

2. Important changes in doing business in the last two years. When asked what important changes—things increased or added—in the last two years, the main items checked by Michigan feed dealers were:

A. Resale work with big company salesmen—62%.
B. Selling greater quantity of non-feed items—48%.
C. Increased advertising promotions—38%.
D. Feed company feed contracts—38%.
E. Sales training for employees—29%.

The addition of bulk facilities, holding more feeder meetings and improving grinding and mixing facilities are also important among the things added or improved during the past two years.

3. One change in the way of doing business in the past two years that has helped business most. There was a wide variation in opinion as to what one change in the way of doing busi-

(Turn to MERCHANDISING, page 91)

PEX CAN HELP WARD OFF BROILER PROBLEMS IN YOUR FLOCK
"BROILERS FED ON PEX GRADE BETTER, SELL BETTER AND TASTE BETTER"
NEW IMPROVED KAFF-A LOOKS LIKE THE BEST MILK REPLACER YET
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* Running in 25 different dairy, poultry and general farm publications.
* Distinctive ads—telling your customers the profit-story of KAFF-A and PEX!
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Feed dealers who tie in to this program will increase their volume and net. Contact your nearest Kraft Branch or write to:

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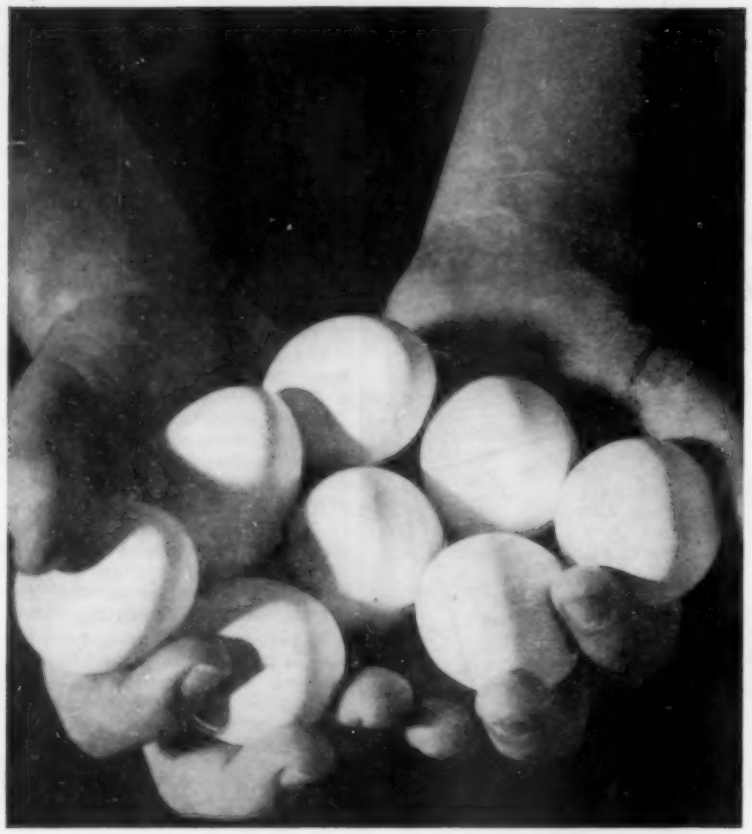


SELL GIZZARD GRINDING

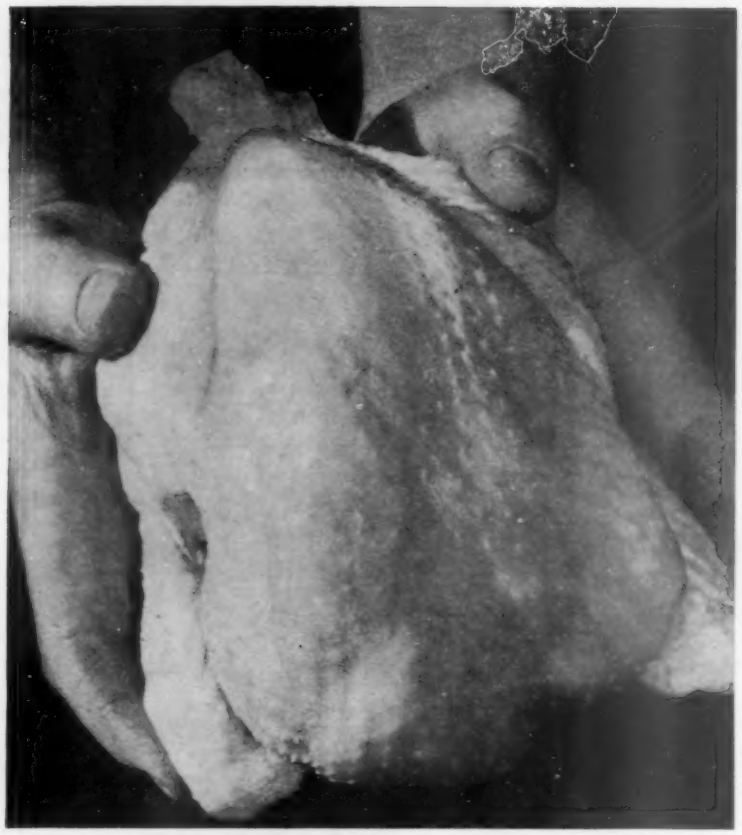
and More Eggs from Your Feed

For extra eggs, your customers' birds need gizzard teeth that are hard, sharp-cutting, quick-grinding, and the proper size. Stonemo hard granite grit is scientifically processed to give your birds *extra grinding surfaces.*

With each contraction of the gizzard, Stonemo Granite Grit rips open the tough hard film which encases the various nutrients of the finest mash. Stonemo also grinds fine the coarse scratch grains, making them more digestible, better used to produce more eggs.

In the latest work of Iowa State College, up to 10% more eggs were produced from the same feed when Stonemo was offered free choice, and with better feed conversion.

So, sell the importance of gizzard grinding with every lot of feed. Sell the right size Stonemo and watch your customers' poultry profits grow.



SELL GIZZARD GRINDING

and Extra Meat from Your Feed

If you have broiler customers who are having a hard time making a profit, here is a tip you and they will appreciate. In a series of feeding tests at our research farm, even when an all-mash diet was used, broilers were heavier, feed conversion was better, profits increased nearly ½ cent per pound against no grit—$16.85 per thousand birds.

Sell Gizzard Grinding, and your customers will find:

- **Birds will rid their gizzards of litter, fiber and feathers—make room for more meat-producing feed.**
- **Less feed will be used to produce a pound of meat, even on an all-mash feeding program.**
- **Birds get to market quicker—your customers start the next lot of broilers earlier—save time and money.**

COARSE SIZE STONEMO HARD GRIT MAGNIFIED 6 TIMES

Make STONEMO your Assistant Salesman

Whenever you sell feed for pullets or broilers, sell Stonemo with it, and make feed do a better job. Point out how changing to larger size Stonemo—Medium beginning the fourth week, Coarse beginning the seventh week—will increase feed efficiency and step up profits.

For further research facts about Stonemo, proper feeding directions, and sales aids including posters, newspaper mats, radio scripts, and the popular hit record "Sing Chicken Sing," write:

STONE MOUNTAIN GRIT COMPANY, INC.
Lithonia, Georgia

The Grit with the "EXTRA GRINDING SURFACES"

FROM ONE DEPENDABLE SOURCE

Sta-Kleen Nesting Material

SELL Sta-Kleen

Sta-Kleen Nesting Material is a natural to sell. Clean nests are so badly needed by poultrymen that Sta-Kleen almost sells itself.

Think of being able to tell your customers they can reduce the number of dirty eggs up to 80%.

Think of the sales appeal to a farmer's wife when you say that Sta-Kleen saves the chore of washing or cleaning eggs.

Think of selling the extra profit angle of marketing top-quality eggs—eggs with the bloom still on the shells.

But that's not all. You can also sell less egg breakage, less cracked shells, less unmarketable eggs, for Sta-Kleen is soft, resilient, and cushions the eggs.

Just as important as the right egg-laying environment is Sta-Kleen's remarkable ability to repel dirt and absorb moisture. Droppings are quickly dehydrated and easily removed from the nests.

What are Sta-Kleen's Advantages to You as a Dealer?

There are four big reasons for you to stock and sell Sta-Kleen. All four can increase your profits.

1. **Sta-Kleen sales give you a good margin of profit.**
2. **Sta-Kleen is a repeat item that constantly builds your business.**
3. **Sta-Kleen is nationally advertised to help you build volume fast.**
4. **Sta-Kleen is display packaged in 50 lb. multiwall bags. It's easy to buy right along with your Stonemo Granite Grit.**

So, order Sta-Kleen today from your supplier of Stonemo Granite Grit. Write direct for folders, posters, newspaper mats.

STONE MOUNTAIN GRIT COMPANY, INC.
Lithonia, Georgia

Sta-Kleen ...another fine product to increase poultry profits

Stone Mountain Grit Makes Film for Georgia

LITHONIA, GA.—Georgia's governor, Marvin Griffin, has accepted on behalf of the state the first motion picture in the "This Is Georgia" film series, documenting and publicizing the story of Georgia and its impact upon the welfare of the nation. This film, entitled "Meat and Bread from Stones," was produced in cooperation with the Stone Mountain Grit Co. of Lithonia. In a brief ceremony at his office the governor received the half-hour 16 mm. color sound film from Charles L. Davidson, president of Stonemo.

The whole story of Stonemo—how it originated, how it is made, the men back of it—is told in the film. Cameramen recorded the story of a grain of grit, from the tremendous blast which loosens thousands of tons of granite, through the various processes—crushing, screening, cleaning, sizing, bagging—finally loading into cars for movement throughout North America. Viewers are taken on a visit through the Stonemo research farm, and they are able to see how grit increases poultry meat and egg production.

The crews visited modern broiler houses, hatcheries and several typical farm operations.

Through the medium of television and private film showings, thousands can get a look at the production, merchandising and marketing of nationally known products. Already scheduled for 300 television showings, this film will be made available for showings at sales meetings, farm and poultry group gatherings, state conventions and schools and colleges. Interested persons should write Stone Mountain Grit Co.

"MEAT AND BREAD FROM STONES"—As part of a "This Is Georgia" film series, the Stone Mountain Grit Co., Lithonia, Ga., has produced "Meat and Bread from Stones." The 30-minute 16 mm. film tells the story of Stonemo, Stone Mountain's grit product. Shown above in one of the scenes from the movie are Stonemo officials Charles Davidson, Sr., J. K. Davidson, Jr., and Charles Davidson, Jr., and the Georgia agriculture commissioner, Phil Campbell.

Power Feed Models Nos. A-3, A-4 and A-4E Edtbauer-Duplex Net Weighers. The No. A-3 weighs 5- to 25-pound discharges; No. A-4 and A-4E, 15 to 50 pounds—of nonfree-flowing cereals and feeds, including pellets, crumbles, dog foods, etc.

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The accuracy, simplicity of operation, and minimum maintenance cost of the Edtbauer-Duplex line are well known in the milling industry. Built in both gravity and power feed models, Edtbauer-Duplex Weighers are in wide use for packaging rice, corn meal and other cereals, rolled oats, pancake and whole wheat flour, animal feeds, and other mill products.

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Premium Suggested For High Quality Hay

SAN FRANCISCO—Growers of top-quality hay must receive a premium price to compete with the low cost and higher yields of poorer quality hay, says Luther G. Jones, agronomist at the University of California at Davis.

For highest yields of quality hay, alfalfa should be cut from the one tenth to one fourth bloom stage, he said. Most of the alfalfa hay in California is harvested in the 50 to 100% bloom stage.

One tenth bloom hay costs about 13% more to produce than one half bloom hay, said the agronomist. But the crude protein and carotene amounts are higher in the earlier-cut hay.

To help growers receive a premium price, Mr. Jones and animal husbandry specialists are working on new tests for the feed value of alfalfa.

Dr. James H. Meyer, associate professor of animal husbandry at Davis, found that carefully-taken samples can be analyzed for moisture content and crude fiber to calculate the total digestible nutrients.

This new testing method, which supplements existing methods of visual grading of hay, is being tried in several California counties this year. It shows promise of standardizing and improving alfalfa hay quality, he said. If adopted, the new test would make it possible for quality-hay producers to get paid more for their product.

Also, feeders, knowing the nutritive value of the hay they buy, could change rations to take advantage of variations in hay quality.

Norman T. Newkirk Joins A. E. Staley

DECATUR, ILL.—Norman T. (Tom) Newkirk has joined the field sales organization of the A. E. Staley Manufacturing Co., Decatur, as Iowa territory manager for the formula feed department, according to Lloyd A. Winslow, manager of the department.

Mr. Newkirk is an agricultural graduate of the University of Missouri. Before joining Staley Manufacturing, he was with Pay Way Feed Mills, Inc., in Kansas City, and with Albers Milling Co. in California.

MALTA N. HARDY DIES

SCOTTSBURG, IND.—Malta N. Hardy, operator of a grain and feed mill here for many years, died recently at a nursing home four hours after his brother, Charles, had died of a heart condition. Malta Hardy had been in ill health for about four years.

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RESEARCH NEWS
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Chas. Pfizer & Co., Inc., Agricultural Research and Development Department, Terre Haute, Indiana

NUTRITION
AND EGG PRODUCTION*

A comprehensive review of current literature on the effect of various feed ingredients on egg production. Summaries provide a handy reference source on the role of carbohydrates, proteins, minerals, vitamins and antibiotics in egg production.

In order to produce eggs economically, a high rate of egg production must be maintained in a flock of laying hens. To secure this, hens must be fed a ration which is complete and well balanced and which meets fully the hen's nutritive requirements. The ration must be palatable and be fed in a manner that stimulates high feed consumption (1).

Carbohydrates supply energy

Carbohydrates include starches, sugars and related products—celluloses, dextrin, pentosans and lignins.

Certain of the carbohydrates—glucose and probably maltose—serve an important function in poultry metabolism. In poultry, the starch substance—glycogen—is stored in liver and muscles (2).

During digestion, carbohydrates are broken down into the simple sugars of monosaccharides —glucose, frutose and galactose—in which form these sugars are absorbed. Monosaccharides readily combine with oxygen—burn to carbon dioxide and water—producing heat. It is upon this heat liberation that life processes of chickens are dependent (3).

Carbohydrates include fiber and nitrogen-free extract in feeds. Nitrogen-free extract consists of starches, sugars, dextroses, pentosans, organic acids, phytin, lignin and other substances (4). When digested and assimilated, nitrogen-free extract can be used by the chicken to produce fat or carbohydrates, or it can be used for the production of heat or other forms of energy (5).

Most of the fundamental knowledge of energy nutrition, its relation to other nutrients and consequences of variations in these factors, has come from extensive studies with chicks (7 & 8).

From these studies it is generally accepted that feed intake is governed by energy concentration of the diet, and this forms the underlying basis of effect of energy level on gross efficiency of feed utilization. Furthermore, the relation of energy and protein balance to growth rate and body composition is being studied. A high level of energy from carbohydrate and fat in relation to protein produces a high level of fat deposition; fat content is markedly reduced when a high level of protein in relation to energy from fat and carbohydrates is employed. In general, these principles appear also to apply to the nutrition of layers, but the quantitative relationships have not been thoroughly explored as yet (8, 9, 10, 11 & 12).

Whether an effect of energy level will be observed on egg production rate can well depend on temperature, level of egg production, strain of chickens, feeder space and consumption and form of the diet, such as the use of pelletized or crumbled feeds in comparison with mash feeds (5).

In experiments with chicks reared to four weeks of age, the productive energy level of the ration is found to influence the protein level required in the ration as measured by growth rate, feed consumption and body composition. As the ratio of energy to protein in the ration is widened, the energy intake and carcass fat deposition is increased and the water content of the carcass is decreased.

As the energy-protein ratio of the ration is increased, less dietary protein and more dietary energy is required per unit of gain (6).

Proteins provide building blocks

Proteins are polymerized units of amino acids which vary in relative amounts and sometimes in kind from protein to protein. These amino acids are obtained as the hydrolytic end products when proteins are acted upon by strong acids, or by certain enzymes. They are also the end products of protein digestion and the building stones from which body protein is made, as well as intermediary products in protein catabolism. And, for this reason, protein nutrition primarily deals with the amino acids of proteins.

Original sources of amino acids are plants which are able to synthesize their own amino acids into proteins. Animals lack this ability to synthesize amino acids, and are, therefore, dependent upon plants or other animals as a source of dietary amino acids. However, animals are able to convert dietary amino acids into many different specialized animal proteins which are used as primary constituents of many structural and protective tissues—ligaments, feathers, nails, skin as well as soft tissues including organs and muscles. When proteins are digested, they are split into a number of chemical compounds, amino acids, which are united again in the animal to produce animal protein or other needed substances. About eleven of the amino acids are absolutely essential, or indispensable — they either cannot be manufactured from other materials by the bird, or cannot be manufactured in quantities sufficient to meet the bird's requirements, and so must be supplied by the feed. The other ten or more amino acids can presumably be synthesized, or converted by the body, except the sulfur-containing amino acid cystine which methionine (also sulfur-bearing) can partially replace.

*A search of available literature reveals a lacking in research information regarding the laying chicken's nutritional needs. Where such information is unavailable, or inconclusive, work done with growing chickens, turkey poults, rats and ruminants has been cited. This editorial practice is followed to give, at least in part, a basic understanding of nutritional requirements for laying chickens. Several workers, in the absence of adequate nutritional information for laying hens, feel that nutritional needs of growing chickens will supply a part, if not an excess, of the laying hen's nutritional needs. It has been suggested that these minimum requirements be supplied until more information is published to indicate a change is necessary in the layer's nutritional requirements.

In feeding practice, neither the amino acid content of the ration nor the amino acid requirement of the bird is completely known. Consequently, it is not always possible to do a perfect job of balancing the amino acid content of the ration. In absence of specific knowledge, it is good practice to put as many different sources of amino acids in the ration as is possible. This must be done intelligently, in order that selected protein sources do not suffer the same amino acid deficiencies. Below is a formula for measuring the daily protein requirements for chicks as calculated by Dr. G. C. Combs of University of Maryland:

$$R = .005\frac{\text{Initial wt. (g)} + \text{Final wt. (g)}}{\text{2X No. of days in period}} + .337\,(\text{Av. Daily gain (g)})$$

Excess amino acids not stored in the body —they are either utilized immediately for their normal functions or are burned for fuel. As proteins are an expensive energy source, it is desirable to feed the minimum protein level and to supply amino acids in correct proportion (4).

This has been illustrated with layers which were observed on suboptimal amino acid intake from a semi-purified diet. These birds in egg production refused to eat until the stress of production ceased. As the birds' requirements for amino acids approach those necessary for maintenance only, the diet becomes adequate, and the hen begins to eat and store proteins toward the time when egg production will again commence. As production resumes, lack of an adequate daily intake of amino acid again forces the hen out of production. The same cycle of alternate feed refusal and egg production has been observed in the absence of vitamin B_{12}. The same is true when an inadequate amount of methionine is fed (14).

Minerals serve body functions

Chemical needs of poultry species include certain elements which are supplied preferably in inorganic form. Other mineral elements are required as integral parts of organic molecules. Although mineral elements yield no energy and may even undergo no change in chemical combination in the body, they are vital to life. The chemical processes which characterize living matter take place in an ionized solution and nearly every function of cellular activity is dependent upon the mineral elements. For example, a large amount of calcium is required by laying birds for the formation of egg shells. In addition poultry species have a high requirement for

manganese which results in the almost universal addition of this element to poultry feeds. Avian species are also peculiar in their inability to utilize efficiently phytin phosphorus—inositol-phosphoric acid—found in ingredients of plant origin (16).

CALCIUM

Calcium is required in the ration in larger amounts than any other mineral. It is also the chief mineral constituent of the body and the whole egg. Some supplementary form of calcium is nearly always added to poultry rations.

Calcium metabolism in poultry is inseparably linked with phosphorus and vitamin D_3, and for proper utilization of calcium an adequate source of phosphorus and vitamin D_3 is needed. When large amounts of vitamin D_3 are included in the poultry rations, less calcium and phosphorus are required. Optimum ratio between these two elements for laying chickens is three or four of calcium to one of phosphorus (17).

While 1.65 per cent calcium has been found to be just sufficient to meet requirements as judged by egg shell strength, egg production, egg shell ash, and by levels of calcium and phosphorus in the blood, the optimum calcium allowance is about 1.8 per cent of ration. On the other hand with White Leghorn pullets the best egg production has been obtained at a 2.5 per cent level of calcium in the ration (18).

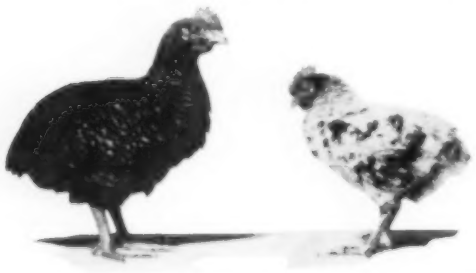
A minimum allowance is recommended at 2.25 per cent for laying hens. The total requirements of calcium need not be provided in the laying mash. In many cases it is customary to meet the hen's calcium requirement by supplying a free choice of a supplementary source of calcium such as ground oyster shells (19).

PHOSPHORUS

Phosphorus is second only to calcium in amount required in the ration and per cent in the animal body.

Phosphorus is closely associated with transfer and release of energy and plays an important part in absorption and utilization of carbohydrates and fats. It is a structural unit of cells, being especially important in the nucleus. The phosphorus requirements of laying hens are reported at 0.75 to 0.80 per cent (20).

Since phytin phosphorus has been shown to



Folic acid deficiency showing depigmentation of feathers in bird on right. Also, note the poor growth and impaired feather development.

be inefficiently utilized by chicks, studies have been recently conducted to determine the effect of phytin on the phosphorus requirements of laying hens.

Some workers show that phytin phosphorus is less efficiently utilized by the hen than usual forms of inorganic phosphorus. On the basis of several reports, the laying hen needs a minimum of approximately 0.40 to 0.45 per cent of inorganic or non-phytin phosphorus for optimum nutrition. When this amount is furnished, the total phosphorus requirement of the hen is not greater than 0.5 to 0.6 per cent of the ration (21).

NRC's subcommittee has recommended an allowance of 0.75 per cent total phosphorus in laying rations with the stipulation that 0.45 per cent should be non-phytin phosphorus (19).

MAGNESIUM

This element is an essential mineral closely associated with calcium and phosphorus metabolism. The magnesium requirement of the chick is about 220 gm. per pound of diet.

Magnesium content of feedstuffs is generally sufficient under practical conditions. It is possible to feed excess magnesium. Dolomitic limestone containing a high percentage of magnesium has been observed to produce adverse effects when fed to laying hens. The use of such limestones are, therefore, not recommended in poultry rations (22).

Clinical symptoms of magnesium deficiency in the chick are charactertized by poor growth and feathering, decreased muscle tone, squatting, ataxia, fine palpable tremors, progressive incoordination of movements, convulsions and death (22).

SODIUM AND CHLORINE

Supplemental amounts of sodium and chlorine in the form of common salt are usually added to poultry rations. Sodium is the more critical of the two elements.

Experimental evidence supports the addition of some salt in most poultry rations. However, there is also considerable disagreement concerning the optimum level of salt additions. Various workers show that levels of salt additions to rations will vary from 0.25 to 2.0 per cent. However, 0.5 per cent per pound of feed is recommended by the NRC.

Toxic effects such as mortality and decreased growth, due to excessive salt, are not ordinarily encountered with levels of less than 3 per cent in the total ration (23).

POTASSIUM

Potassium is indispensable to life. The amount required by chicks is greatest during early stages of growth, but remains appreciable throughout life. The suggested requirement for this element for layers ranges from 0.17 to 0.24 per cent of the ration. Laying hens changed to diets deficient in potassium cease production within a period of 4 to 5 days and suffer high mortality.

Fortunately, potassium is widely distributed in feedstuffs, particularly in those of plant origin. There is almost no possibility that a deficiency of potassium will occur under practical feeding conditions (24).

MANGANESE

Manganese is an essential element of great economic importance in the feeding of poultry. It is one of the trace minerals which may be needed in supplementary form. In the laying hen, manganese deficiency may result in failure to maintain weight, decreased egg production, reduced egg shell strength and greatly reduced hatchability. A defect in the formation of bone from cartilage occurs in the embryos of eggs from deficient hens. Chicks, hatched from eggs laid by hens fed manganese-deficient diet, sometimes exhibit incoordination of muscular action and abnormal smallness of limbs (25).

Most investigators have reported that from 15 to 25 mg. of manganese per pound of feed are required in the ration for maximum rate of growth and prevention of perosis in chicks. The presence of excess amounts of other minerals in the ration, particularly calcium, phosphorus and iron, interferes with the absorption of manganese and increases the amount needed in the diet.

Laying and breeding hens of the heavy breeds have been found to require more manganese for production and hatchability of eggs than do hens of light breeds. It has been reported that New Hampshire hens in their second year of production required approximately 35 mg. of manganese per pound of feed for maximum egg production.

Generally, 20 mg. of manganese per pound of feed in laying rations is considered adequate (26). The manganese content of ingredients in most poultry rations is generally too low to meet recommended allowances for this element. Studies on different samples of the same feedstuff have shown wide fluctuations in their manganese content (27). It, therefore, is unsafe to place great confidence in average values found in tables of feed composition. Many feed manufacturers find it a safe practice to add manganese to poultry feeds routinely rather than to risk deficiency of this element.

Supplementary manganese is most commonly added to poultry rations in the form of manganese sulfate (28).

IODINE

Iodine is required in trace amounts for normal functioning of the thyroid gland in poultry. The problem of iodine deficiency in water and crops is confined to areas in which the soil is deficient in this mineral. However, since feedstuffs are often fed in areas distant from their site of production, the problem of iodine deficiency in poultry is not necessarily confined to iodine-deficient soil areas.

Use of 0.5 per cent or less of iodized salt (approximately 318 mg. iodine per ton) is specifically recommended in all cases where supplementary iodine may be needed. It is very probable, however, that the majority of poultry rations do not require supplementary iodine in any form, especially where marine products such as fish meal or fish solubles are used (28).

IRON, COPPER AND ZINC

Iron and copper are necessary for hemoglobin formation in poultry. At present, however, there is little or no evidence to indicate that deficiencies of iron, copper or zinc occur in the practical laying rations. In one study addition of zinc to the basal diet of chicks improved growth rate but with no statistical significance. A combination of potassium and zinc produced a faster rate of gain than potassium alone in all trials, and the difference is shown to be highly significant (28 & 29).

Vitamins catalyze chemical changes

VITAMIN A

All animals require a dietary source of vitamin A. The vitamin does not occur as such in plant products, but occurs as provitamin A, a carotene which can be converted to vitamin A by the bird.

Vitamin A is supplied in two forms—provitamin A (carotene) and as vitamin A ester. Carotene is converted to vitamin A alcohol and is absorbed from the lumen of the intestine. Transformation of provitamin A to vitamin A occurs in cells of the intestinal wall. Vitamin A as an alcohol is then transplanted to the lymphatic system, thence to the general circulation.

It is indicated that one molecule of beta-carotene in the ration is converted to one molecule of vitamin A alcohol and the smaller inactive fragments. Liver and other tissues remove excess vitamin A and maintain normal levels in the blood. Vitamin A is stored in the liver predominantly as the ester form.

Requirements of vitamin A in the laying chicken's ration as stated by the NRC is 2,000 U.S.P. units of vitamin A activity in each pound of feed.

In the case of vitamin A deficiency in chickens, secretions of the tear glands dry up and an infection may then occur, resulting in a discharge that causes lids to stick together. At least some of these symptoms develop as a result of basic epithelial changes caused by a deficiency of the vitamin. Normal epithelium in various locations throughout the body are replaced by a stratified, keratinizing epithelium in vitamin A deficiency. This effect has been noted in the respiratory, alimentary and reproductive tracts, as well as in the eye. Keratinization lowers the resistance of the epithelial tissues to the entrance of the infective organisms. Thus, respiratory troubles, such as colds and sinus infections, tend to be more severe in vitamin A deficient birds.

In mature fowl symptoms noted in chicks may develop much more slowly, but eye disorder often becomes more acute. Egg production and hatchability are markedly reduced.

VITAMIN D_3

Of the various forms of vitamin D, vitamin D_3 is considered to be the most effective form in poultry rations. Undoubtedly, vitamin D_3 is required for normal calcification of the growing

Biotin deficiency in chick. Note severe dermatitic lesions on bottom of the feet. Similar lesions appear at corners of mouth and on eyelids.

Choline deficiency in chick at left is characterized by slipped tendon, swollen hocks and twisting of legs. Poor growth and feathering also result.

bone in chickens, but the amount needed varies with the mineral relations in the diet and also with the species. More of the vitamin is required when the amount of either calcium or phosphorus or the ratio between them is suboptimal. But no amount will compensate for severe deficiencies of either mineral.

Vitamin D_3 aids calcium and phosphorus metabolism in a number of ways. It promotes net retention of the minerals in the body by increasing absorption or by decreasing re-excretion, particularly with calcium. It helps maintain normal blood levels of the two minerals, and has some specific action in connection with deposition of lime salt in bone. Information regarding these functions has been made much more specific by recent isotope studies. Biochemical mechanisms, by which vitamin D_3 acts, remain unknown. There is some basis for relating its effect on calcium and phosphorus metabolism to activity of alkaline phosphatases which are present in bone, blood and other tissues. Blood phosphatases increases in a deficiency of the vitamin, and its level is used in detecting rickets. The level is restored to normal upon administration of vitamin D_3.

The body has some ability to store the vitamin, although to a much lesser extent than is the case for vitamin A. Principal storage of vitamin D_3 occurs in the liver, although there is some storage in other body tissues.

Requirements of vitamin D have been expressed in I.C.U. (International Chick Units) per pound of feed inasmuch as chickens generally use vitamin D_3 from fish oils and irradiated ani- from irradiated ergosterol as effectively as do mal sterol effectively but do not use vitamin D_2 rats and mammals (28). Vitamin D_3 requirement for laying hens set by NRC is 225 I.C.U. per pound of feed.

Rickets, one of the vitamin deficiency symptoms, is a disturbance of calcium and phosphorus metabolism. A lack of vitamin D_3 also decreases egg production and hatchability, and the few eggs produced have either thin shells or are without shells. The vitamin content of eggs is influenced by the amount present in the hen's diet.

VITAMIN E

Vitamin E is a fat-soluble vitamin necessary for the proper nutrition of chickens. Of the seven forms of vitamin E, alpha-tocopherol is the most biologically active. It is a multifunctional vitamin.

On a low fat, semi-purified vitamin E-free diet, d-alpha-tocopherol acetate demonstrates effectiveness in improving hatchability. This finding has been confirmed with turkeys. Normal hatchability results with addition of 20 I.U. of d-alpha-tocopherol acetate per pound of feed. The requirement for maximum hatchability is estimated to be between 12 and 24 I.U. of vitamin E per pound of feed.

When stating the requirement of poultry for vitamin E, it should be remembered that free tocopherols and their esters differ in proportion to their molecular weight, and natural and synthetic forms differ in biological activity by at least 36 per cent, with the synthetic form the lower in activity.

Requirement of laying hens for vitamin E has not been thoroughly investigated. However, vitamin E supplements have a definite place in rations. The alpha-tocopherol requirements of hens are probably similar to the requirement for turkey hens—12 to 24 I.U. per pound of feed.

Symptoms of vitamin E deficiency differ greatly depending upon the species. Alpha-tocopherol is frequently interrelated with other nutrients so that deficiency symptoms may depend on an imbalance of other nutrients. Eggs from hens on a vitamin E-low diet exhibit a high embryonic mortality between the 24th and 28th day of incubation (30).

VITAMIN K

When vitamin K is deficient, the coagulation time of blood is increased and the prothrombin level is decreased. The function of the vitamin is to maintain this level by means of its influence on prothrombin formation that takes place in the liver. Adequacy of vitamin K is determined by measuring clotting time of blood. When time is prolonged, either a decreased absorption or a decreased utilization of the vitamin is indicated. However, in poultry, synthesis takes place in the large intestine to the extent that a dietary need is largely eliminated for these species (28).

THIAMINE

Studies with thiamine (vitamin B_1) show this vitamin to be required in metabolism of all species. All animals, however, must have a dietary source, unless it is synthesized for them by micro-organisms in the digestive tract.

Thiamine functions as a constituent of cocarboxylase, a coenzyme of several enzyme systems, notably that concerned in the oxidative decarboxylation of pyruvic acid to a two-carbon compound. This is an essential reaction in utilization of carbohydrate to provide energy. The failure of normal carbohydrate metabolism which results from a deficiency of vitamin B_1 explains the specific symptoms involved. The vitamin is absorbed from both small and large intestines. While a high level of intake may be reflected in a somewhat higher blood level, there is little storage in the body (28).

More work needs to be done with establishing the thiamine requirement of the laying hen. Requirement of thiamine for the layer is not established, but the requirement for the starting chick has been set at 0.8 mg. per pound of feed. Until the requirement for the laying hen is better understood, it is suggested that 0.8 mg. per pound of feed be offered to the egg-laying hen. Intakes in excess of current needs are rapidly excreted as such in the urine.

Day-old chicks when placed on a thiamine-low ration develop polyneuritis within nine to twelve days. In the acute stage of polyneuritis the head may be drawn over the back. Thiamine deficiency also leads to loss of appetite, emaciation, impairment of digestion, general weakness and, frequently, convulsion.

Symptoms of thiamine deficiency in mature birds are similar to those described for chicks. When the vitamin is given in the diet, recovery is amazingly prompt (19).

RIBOFLAVIN

Riboflavin is sometimes referred to as vitamin G, or vitamin B_2, and is required in hen's body as a constituent of several enzyme systems. The enzymes, commonly known as flavoproteins, are required along with DPN (diphosphopyridine nucleotide) and TPN (triphosphopyridine nucleotide) for normal metabolism. Riboflavin is also a constituent of amino acid oxidases which function in the final stages of protein metabolism and of xanthine oxidase, which is concerned in purine metabolism. The vitamin is phosphorylated in the intestinal wall and carried by the blood to the tissue cells, occurring as a phosphate or as a flavoprotein. Requirement for normal development and egg production is 1 mg. per pound of feed for the laying chicken.

In view of the basic roles of the vitamin in release of food energy and assimilation of nutrients, it is understandable why a deficiency is reflected in a wide variety of symptoms. The most characteristic symptom of riboflavin deficiency in chicks is curled-toe paralysis. The chicks are noted to be walking on their hocks with their toes curled inward. Diarrhea is another common symptom in chicks. In laying birds, a deficiency of riboflavin results in low egg production and poor hatchability.

Following a period on a riboflavin deficient diet, a liberal intake of the vitamin results in some increase in the blood level and in the tissues. The total amount thus stored is small and intakes above normal current needs are rapidly excreted in the urine (3).

NIACIN

Niacin, or nicotinic acid; 3 pyridine carboxylic acid (also, niacinamide, or nicotinamide; 3-pyridine carboxylic acidamine) occurs in all plants and animal tissues (28).

In the body nicotinamide functions as a component of two coenzymes—DPN and TPN. These act in conjunction with flavoprotein enzymes in cell respiration. It has been demonstrated that tryptophan compensates for a partial niacin deficiency, indicating that tryptophan is converted to niacin by the chick. And, for this reason, it appears that requirements for niacin cannot be stated accurately without considering the tryptophan content of the diet. In this study, chick requirement for tryptophan is not more than 0.14 per cent in the presence of 13.0 to 14.0 mg. of niacin per pound of feed, and it is not more than 0.24 per cent (0.14 basal and 0.1 DL) in the presence of 8.6 mg. of niacin per pound of feed (32).

In chicks the deficiency is characterized by poor growth and poor feathering, perosis and occasionally a scaly dermatitis. On a niacin-low diet turkey poults develop an enlarged hock disorder (19).

PYRIDOXINE (VITAMIN B_6)

This vitamin is a dietary essential for most species, including microorganisms. Microbiological studies have shown that vitamin B_6 functions in several enzyme systems concerned in protein metabolism. In the form of phosphorylated pyridoxal it serves as a coenzyme for enzymes which decarboxylate several amino acids. The vitamin also functions in a variety of other reactions concerned in the metabolism of amino acids. Pyridoxine is also concerned in some way with fat metabolism (28). Requirements of this vitamin for the egg producing hen are 1.3 mg. per pound of feed (19).

The deficiency of this vitamin in the diets of mature birds results in a characteristic loss of appetite, followed by rapid loss of weight and death. Egg production and hatchability are markedly reduced.

PANTOTHENIC ACID

Pantothenic acid is a dietary essential in chickens, although intestinal synthesis of pantothenic acid has been found to occur in all species studied. As a constituent of coenzyme A, the vitamin plays an essential role in many basic biochemical reactions. The coenzyme functions in the acetylation of choline and other compounds. Its combination with two-carbon fragments from fats, carbohydrates and certain amino acids to form acetyl-coenzyme is an essential step in their complete metabolism. The coenzyme enables these fragments to enter the critic acid cycle. It also plays an essential role in cholesterol synthesis (33). Recommended level of pantothenic acid for the laying hen 21 mg. per pound of feed (19).

In the absence of vitamin B_{12} the pantothenic acid requirement appears to be increased. When no B_{12} is added to the diet, the hatchability of eggs from hens fed the low pantothenic acid diet is shown to be reduced to unsatisfactory levels by the third month. When the diet contained 1.0 mcg. or more of B_{12} per pound of feed, hatchability has been sustained over 90 per cent at either level of pantothenic acid even after confinement of hens to wire-floored pens for six months (34).

There is, in pantothenic acid deficiency, a retardation of growth and feather development and later dermatitis appears. Eyelids become granular and stick together and necrosis appears around the mouth, vent and on the feet. Liver damage, changes in the spinal cord and several other post-mortem findings are to be noted. Hatchability is decreased.

BIOTIN

Very little is known about the basic metabolic functions of biotin, and most of the information available has been obtained in studies with microorganisms. It has been reported to function in the carbon-dioxide fixation by which pyruvate is converted into oxaloacetate and also in the decarboxylation of oxaloacetate. There is evidence that it plays a role in the deaminating enzyme systems for certain amino acids. Certain bacteria requiring biotin can grow without it if oleic acid is supplied. This indicates metabolic interrelationship between the two compounds (34). Because so little is known of this vitamin, it is suggested that the requirement of growing chickens, which is 0.04 mg. per pound of feed, be incorporated in the laying hen's ration.

Feeding mature fowl a biotin-deficient ration causes reduced hatchability while egg production is not adversely affected, indicating that the requirement for the production of hatching eggs is much higher than that necessary for maintenance of good health and egg production. In hens no dermatitis similar to that of chicks fed biotin-deficient rations has been observed (19). Biotin has also been found useful along with manganese, choline and folic acid in preventing perosis.

CHOLINE

Choline is a constituent of the phospholipid lecithin. Long recognized is the importance of phospholipids as constituents of cell and tissues throughout the body and the choline component as a specific dietary essential under certain conditions. It also plays an essential role in fat metabolism in the liver, preventing the abnormal accumulation of fat. It is essential for the formation of acetylcholine, a substance which makes possible the transmission of nerve impulses. It plays a nonspecific role as a source of biologically labile methyl groups and a specific one in the prevention of perosis.

Both choline and methionine contain biologically labile methyl groups which can be transferred within the body, the phenomenon being called transmethylation. In this way methionine can partially replace choline as a dietary essential, and choline plus homocystine can replace the essential amino acid methionine (36).

Results of two experiments point out that choline requirement of breeder hens is not over 500 mg. per pound of diet in presence of adequate B_{12}. However, this requirement may be influenced by the level of added animal fat in the diet (37).

Choline deficiency has been produced in chickens with manifestations of slow growth, fatty livers, and perosis.

FOLIC ACID

Folic acid is an anti-anemia factor, however its biochemical role in the body is not completely understood. Folic acid has been found to be a dietary essential for the chick.

Several studies have shown the actions of folic acid and other vitamins to be interrelated in ways only partially understood. Both folic acid and vitamin B_{12} appear to function in the synthesis or metabolism of various compounds making up nucleic acids, and both seem to be involved in thyrosine metabolism (38).

According to some workers, both folic acid and vitamin B_{12} have a choline-sparing action and in chicks they have a sparing action in connection with growth and prevention of perosis.

For the prevention of the onset of folic acid deficiency in the laying chicken, it is recommended that for each pound of feed 0.11 mg. of folic acid be added (19).

A deficiency of folic acid in young chicks results in perosis, retarded growth, poor feathering and, in colored chicks, feather depigmentation. These symptoms are accompanied by the development of an anemia which is characterized by a reduction in number of red blood cells and hemoglobin.

VITAMIN B_{12}

Vitamin B_{12} is a metabolic essential for all species studied. The specific biochemical functions of certain vitamin B_{12} remain uncertain. It is concerned in the synthesis of nucleic acid and also in the synthesis of methyl groups. Certain growth studies also suggest roles in carbohydrate and lipid metabolism. The vitamin has been found to counteract thyrotoxicity in rats, an observation which may indicate another function of basic importance (39). The tentative requirement set for breeding hens is 0.002 mg. per pound of feed (19). High protein diets increase its requirement. In the hen, body weight and egg production are maintained despite a deficiency of this vitamin, but poor hatchability results, and the chicks which hatch show bone abnormalities similar to perosis (39).

OTHER VITAMINS B

Two vitamins in the group of B vitamins include inositol and para-aminobenzoic acid. Inositol occurs widespread in animal feeds, and thus commonly fed rations should have an abundant supply to meet any need of the laying hen. With the other, para-aminobenzoic acid, no evidence has been shown in the literature indicating that para-aminobenzoic acid performs essential functions in otherwise complete rations.

Antibiotics improve egg production

The constant effort to produce food from animal sources at lower costs has brought about additions of antibiotics, unidentified growth factors, various hormones and chemicals to rations of the laying hen. One of the important additions to the layer ration is the antibiotic.

Amount of antibiotic usually incorporated into the laying chicken rations is from 10 to 100 gm. per ton of total ration. In periods of severe disease outbreak, such as with the incidence of synovitis, the level may be raised to 200 gm. per ton of complete ration. A typical recommendation for the addition of a broad spectrum antibiotic is as follows: first month of laying period, 50 gm. per ton of feed; second through sixth or eighth months, 10 to 25 gm. per ton; thereafter until egg production begins to fall off, 50 gm. per ton; during periods of stress, 50 to 100 gm. per ton; or in a period of high disease level, 100 to 200 gm. per ton.

In a series of studies, under stress of high air temperatures, egg production has been increased with a broad-spectrum antibiotic added to the diet at 50 to 100 gm. per ton of ration. The increase in egg production is shown to be greater among poor layers than among the good layers. The author states that the trends of the effect of the antibiotic in the feed during cooler weather periods of these trials are similar to those during hot weather (40).

Percent growth response is influenced by (1) age, being greatest in the early growth period; (2) type of ration, since other factors being equal, the better overall nutrient balance, the less the response; and (3) the environment, particularly the "disease level" of individual and the "contamination" of the housing quarters. A most interesting observation, made by a number of workers, is the phenomenal increases in rate of gain brought about by the feeding of antibiotics to poor doers. There is also evidence that such feeding may reduce the incidence of certain bacterial diseases in poultry.

The antibiotic effect has been ascribed by many workers to be an action on the microbial population of the intestinal tract. Three theories or combinations thereof are advanced: (1) elimination of pathogens or of bacteria which produce toxins that reduce the growth potential of the laying chicken; (2) depressing the growth of organisms that compete with the host for nutrients or which may absorb nutrients; and (3) encouraging the growth of beneficial organisms which synthesize known unidentified nutrients.

Evidence has been presented that antibiotics bring about improved egg production by the elimination of an infectious condition, although there is no demonstrable evidence of such a condition other than a depression of growth potential. These workers, unable to obtain a growth response with chicks reared in a new environment—one in which chicks had not been kept previously—did obtain a growth response with chicks reared in old quarters which had been in use for some time.

Unpublished results show that newly hatched chicks, placed in isolation boxes, showed no response to an antibiotic, but if fed a small amount of intestinal contents of infected birds the growth of birds not receiving the antibiotic was depressed but not that of birds fed the antibiotic. Autoclaved gut contents from infected birds or fresh gut contents from non-infected birds had no effect on growth.

It has been postulated that antibiotics act by stimulating the appetite, and that the increased intake of nutrients causes the increase in growth rate. Several other workers report an increase in food consumption as a result of antibiotic feeding.

Although there is some evidence to the contrary, the consensus is that removal of the antibiotic from the diet of egg producing chickens results in a decrease or cessation of egg production.

From carcass analyses of poults, it has been concluded that the growth increase resultant from an antibiotic had little relation to carcass composition. The antibiotic supplementation produced larger birds of normal composition.

One important aspect of the feeding of antibiotics is their effect in sparing nutrients. There is evidence that antibiotics lower the protein requirements of growing chicks; there is evidence that antibotics tend to increase the requirement and the same situation pertains to essential amino acids. It appears doubtful if the antibiotics actually lower protein requirement, although they may increase utilization. Since antibiotics increase feed consumption, it is possible that antibiotic-fed birds actually ingested as much protein as their controls, in spite of the lower per cent protein in the ration. Further, the protein requirement is also dependent upon the type of tissue being laid down (41).

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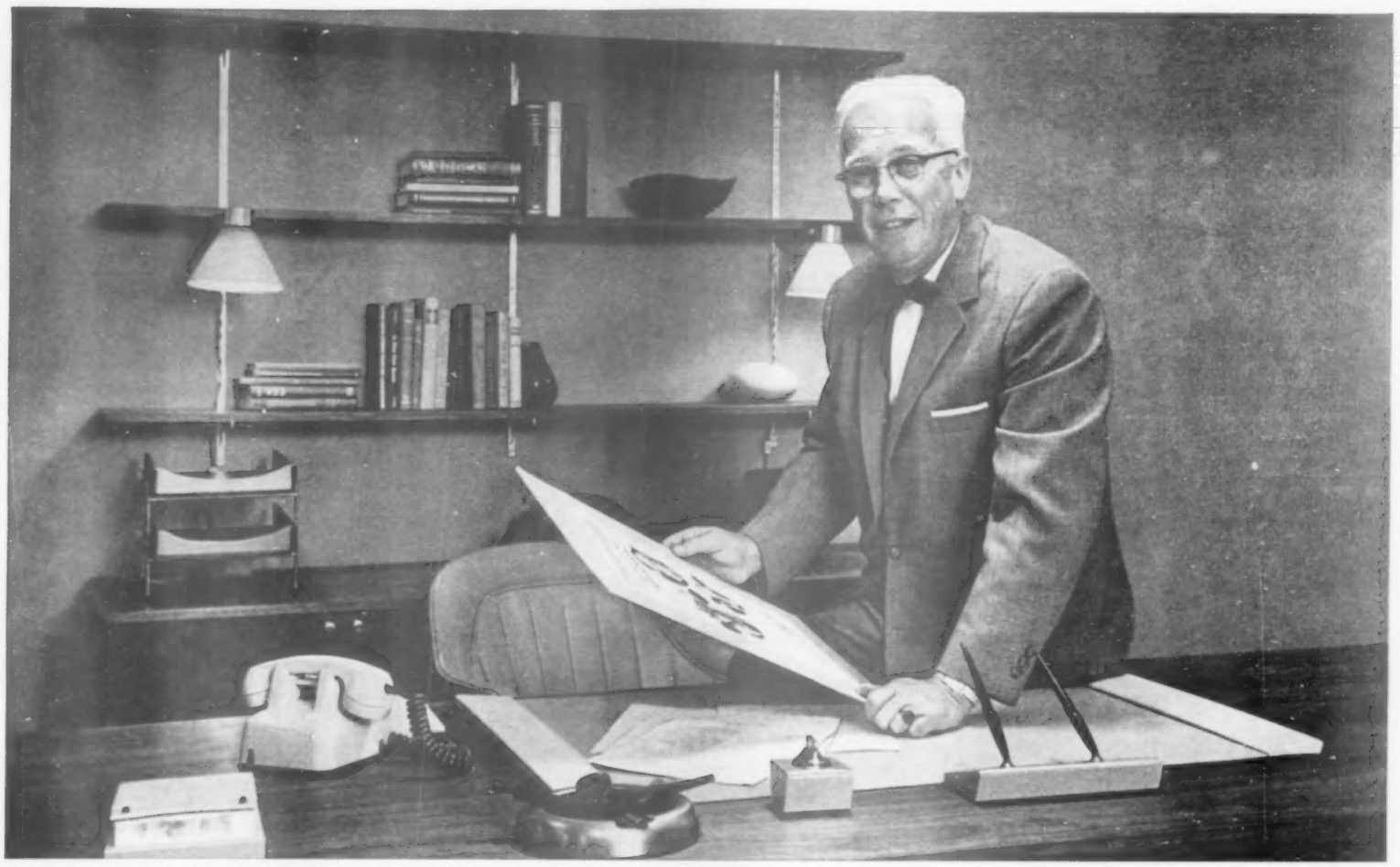
"Aggressive feed dealers are profiting from Quaker's modern advertising and merchandising programs,"

says **A. A. DENNERLEIN,** *Manager of Ful-O-Pep Feed Advertising and Merchandising of The Quaker Oats Company, in this report to Ful-O-Pep Feed Dealers*



A. A. DENNERLEIN joined The Quaker Oats Company in 1925 as a Poultry Specialist in the Feed Sales Department upon graduation from the University of Wisconsin. "Denny" was promoted to manager of Ful-O-Pep Feed Advertising in 1950 and manager of Ful-O-Pep Feed Advertising and Merchandising in 1956.

"I'm glad to have this opportunity to bring you up-to-date on our modern advertising and merchandising programs.

"It's a pleasant task for me, because over the past 33 years I have seen what advertising can do to help Ful-O-Pep Dealers grow and prosper.

"Ful-O-Pep trade-mark is one of the best known. Ful-O-Pep Feeds have been advertised continuously since 1917. For 15 years, Ful-O-Pep advertising penetrated farm homes with the popular radio program, 'Man On The Farm.'

"However, we here at The Quaker Oats Company don't have much time to reminisce about the past because the feed business is changing and moving ahead too rapidly for that. We are constantly revaluating our markets and changing our advertising and merchandising strategy to meet the changing times.

"Quaker promotes meat-type hogs. The Quaker Oats Company is vitally interested in cooperating with the pork producer to improve the quality of pork and to help your customers receive a better price for their hogs. As an incentive, The Quaker Oats Company is offering qualified feeders a bonus or a premium for Ful-O-Pep fed hogs.

"Ful-O-Pep has quality egg program, too. Quaker is promoting a quality egg production program whereby the egg producer, feed dealer, feed manufacturer and the egg buyer can —working as a team—produce finer quality hatching and top quality market eggs for specified markets. Both of these modern programs are currently being promoted in several markets.

"Advertising is tailored to fit your store. As you know, the major share of our advertising dollar is spent at the local level. We know that by localizing our advertising and pin-pointing our efforts to your store, we can serve you better. When you become identified with Ful-O-Pep your Ful-O-Pep District Representative will help you plan local advertising, special events, product and live displays, and direct mail, so that it will get maximum results in your own sales territory.

"We invite you to find out more about Quaker's modern advertising and merchandising programs and how they are helping your customers sell more meat, milk and eggs – how they can help you increase your feed sales and profits, too."

Arm A. Dennerlein

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Producing Complete Pelleted Rations for Ruminants

- Handling Hay
- Grinding Hay
- Mixing Ingredients
- Mill Layouts
- Pelleting Operations
- Handling Pellets

By Oak B. Smith
Wenger Mixer Manufacturing Co.

Can cattle and sheep be economically fattened on complete pelleted rations based on hay? Much has been written about this probability since the Dixon Springs (Illinois) Experiment Station released reports that hay was very greatly increased in value as a feedstuff for calves when the hay was pelleted.

Since that date reams have been written about field pelleting, wafering, field chopping for pelleting, green pelleting, etc.

However, many nutritionists, and some experimental feed lot operators, believe that the maximum economic use of this remarkable discovery can only be obtained if a complete pelleted ration is supplied to the ruminant which contains all the ingredients needed for optimum growth and minimum costs per pound of gain consistent with the finish desired. A complete pelleted ration based on hay would presumably include (in addition to the ground hay):

(1) Some ground grain for energy, carcass grade and improved rates of gain (grain level in ration would vary with age and finish of cattle).

(2) Molasses (for energy, palatability, optimum development of rumen bacteria).

(3) Some proteins (needed only where the protein of the hay was below the recommended protein levels for fattening ruminants). Some believe, including this writer, that low quality hays may become important in this ration. Note that the University of Illinois work reported outstanding improvements when poor hay was pelleted—⅓ alfalfa and ⅔ timothy.

(4) Mineral mix.

(5) Premix possibly containing stilbestrol, antibiotics, tranquilizers, etc.

Without attempting to judge the economic merits of pelleting a straight hay, or a complete balanced ration for ruminants, let's take a look at the kind of arrangements which would make practical the pelleting of the complete balanced rations based on hay. It appears that such a ration may be produced most

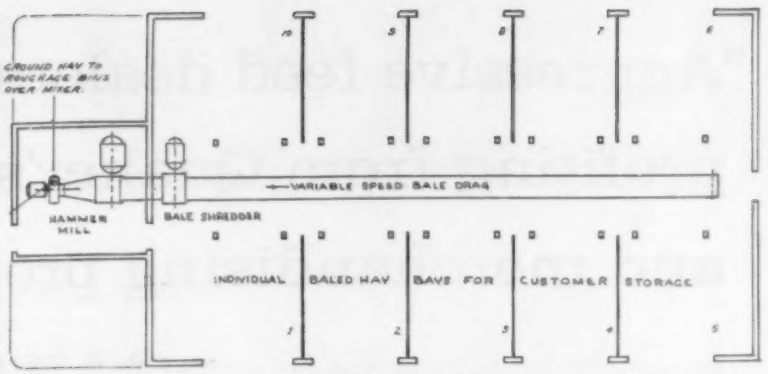

GROUND HAY TO ROUGHAGE BINS OVER MIXER
VARIABLE SPEED BALE DRAG
HAMMER MILL
BALE SHREDDER
INDIVIDUAL BALED HAY BAYS FOR CUSTOMER STORAGE

FIGURE 1. This shows an arrangement of a hay bank or shed located separate from but close to the feed mill building. Individual bays for each customer maintain identity of the hay used in custom pelleting. Drag feeder feeds bale shredder and hammermill. Ground hay is blown through collector into roughage bin in mill for mixing with grain and concentrates before pelleting.

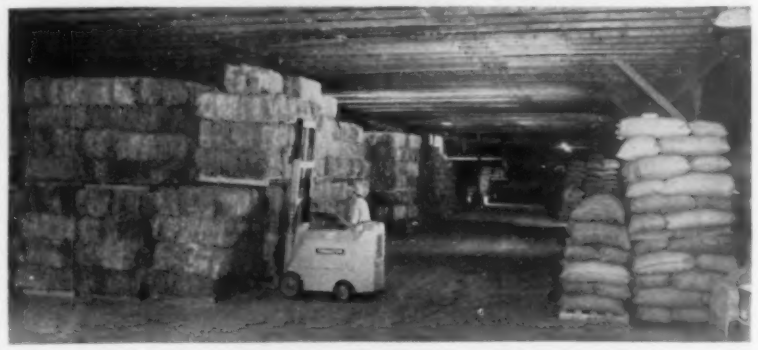
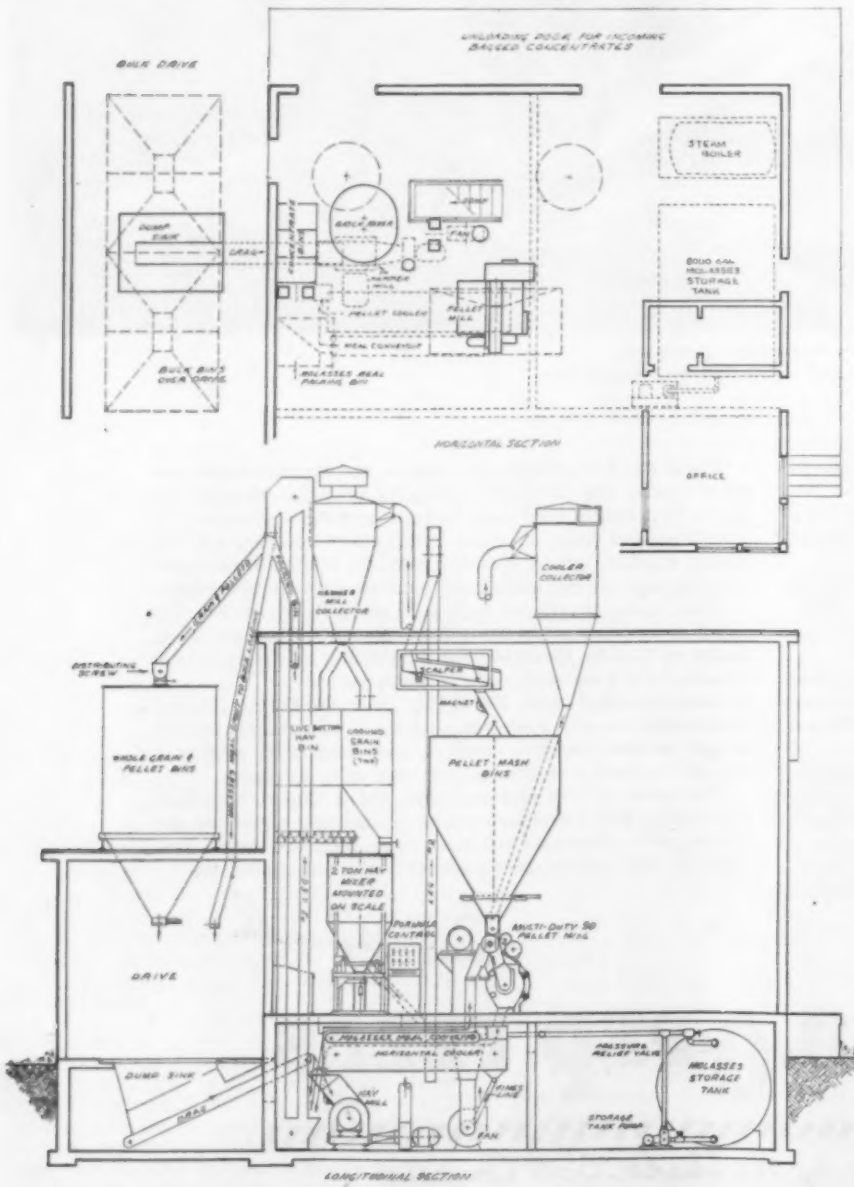
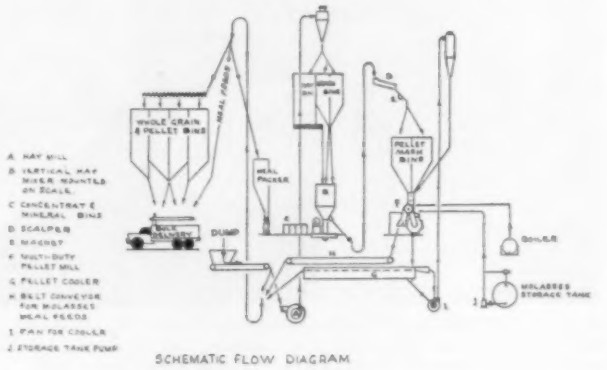


FIGURE 2. A hay bank, with the baled hay on pallets and moved by forklift truck. This picture was taken at the Western Oregon Milling Co., Philomath, Ore.





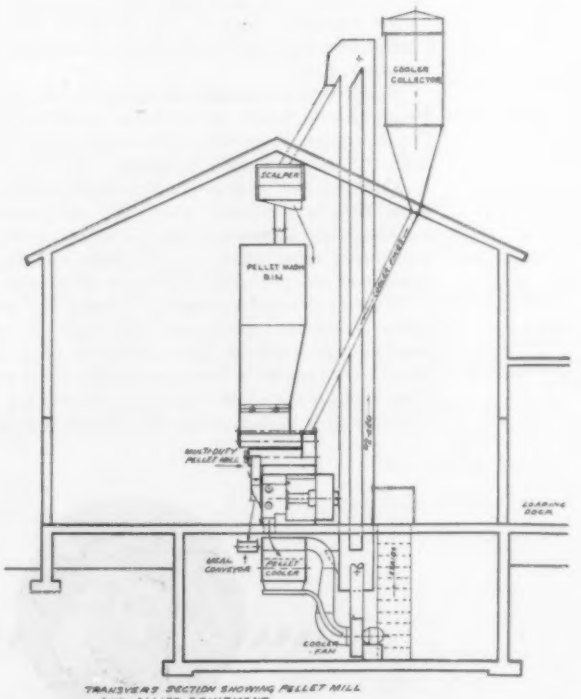


FIGURE 3. Typical custom pelleting installation for the country feed mill producing pellets and molasses meal feeds from locally grown grains, hays and protein, and using concentrates and/or premixes supplied by one of the formula feed manufacturers. This installation shows minimum equipment required for efficient operation.

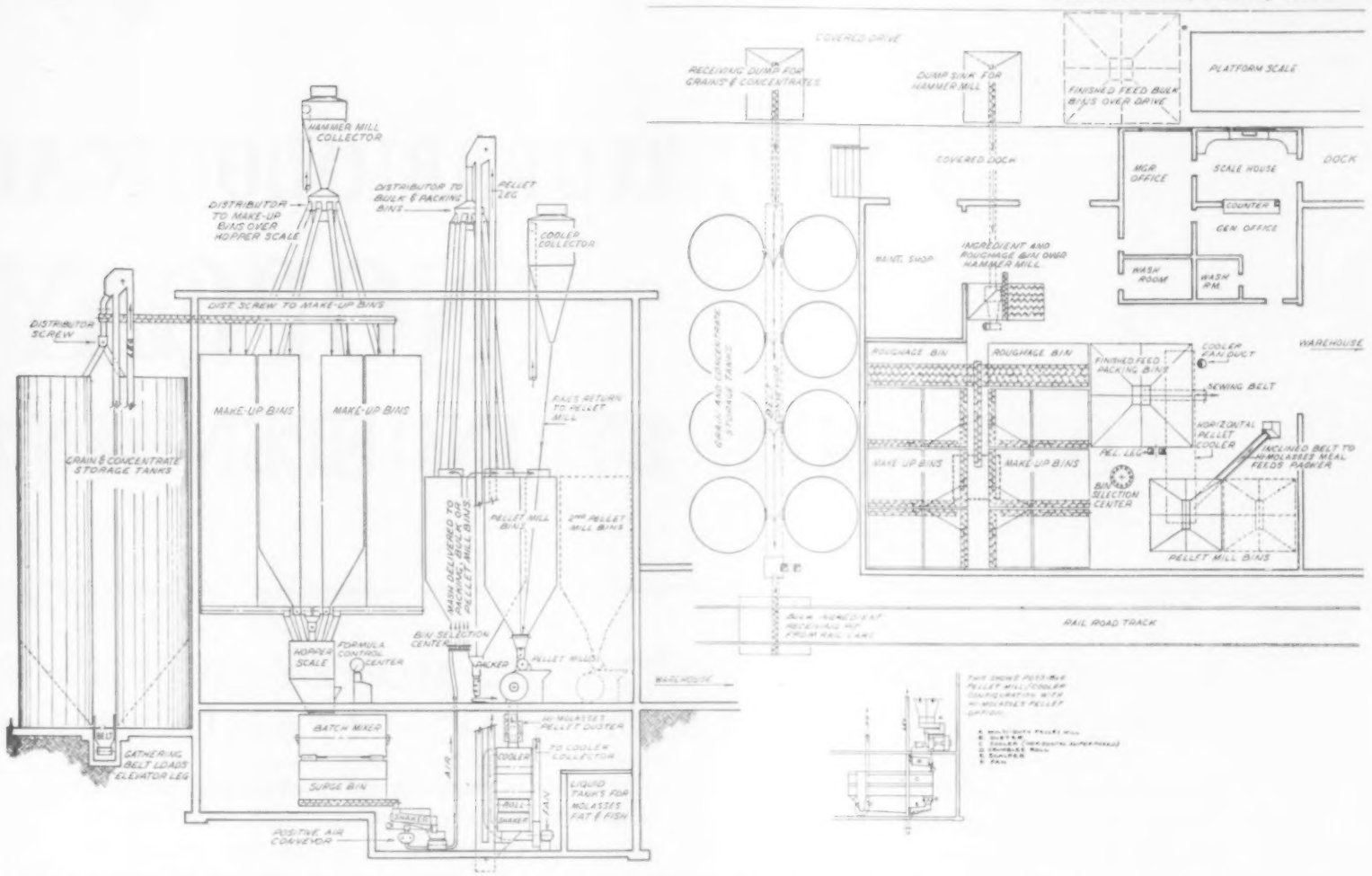


FIGURE 4. This is a more comprehensive layout than that for the custom mill in Figure 3. This layout is for a country mill desiring to produce a reasonably full line of formula feeds, including hay-based pellets, in its facilities.

satisfactorily by the country feed mill close to the market, close also to local supplies of hay and grain. Part of this feed probably will be custom pelleted.

Receiving and Handling Hay

Presumably, most of the hay to be incorporated into these complete rations will be received in the baled form. The new field wafering equipment may prove important here, but until more is learned about the economics of wafering, let us assume that baled hay will be principally used. Baled hay will normally be stacked in the bale, and the bales conveyed to a drag feeder which runs down the center of the storage space to a shredder. Where enclosed storage for baled hay is used, a small electric hoist mounted on tracks and equipped with tongs is a labor saver in moving bales from stacks to the bale drag feeder.

Where the mill produces or purchases its own hay for pelleting, hay may be stacked as space and facilities permit. For custom pelleting operations, on the other hand, a "hay bank" may be preferable.

The "Hay Bank" in Custom Pelleting: Since there is such a variation in quality in hays, it is desirable, in custom hay pelleting operations, to divide the hay storage space available into several bays, one bay to be set aside for each customer. This will permit the custom miller to draw upon that customer's "hay deposit" for incorporation into the pelleted rations being produced for him. Under this hay bank arrangement, the customer simply brings a truck load of hay each time his hay in the hay bank gets low. (See Figure 1.)

Other "hay bank" arrangements may prove practical. Baled hay may be loaded onto pallets as it is received, for example, with each pallet tagged with the customer's name. Pallets may then be conveyed as required by fork lift to the bale shredder. (See Figure 2.)

While the "hay bank" will normally require some arrangement to separate one customer's hay from another customer's hay, a "grain bank" is often operated by the custom shop in its regular grain elevator, with grains from all customers weighed, graded and stored with other grains of the same grade. With both grain and hay "on deposit" in the custom mill, a customer needs only to telephone a production order to the feed mill, which then draws on his hay and his grain, and grinds, mixes with concentrated premixes and pellets the mixture. When the customer comes in to pick up his pelleted rations, he can bring another truck load of hay for the hay bank. A hay and grain bank arrangement will eliminate customer waiting, will even out production in the custom mill, and improve customer relations.

Grinding Hay: Normally bale ties will be cut and pulled just as the bale is delivered to the drag feeder. A bale shredder is recommended ahead of the hammerill. This shredder may be of the lawnmower reel type or the type which uses high speed wheel with knives fixed on the face of that wheel. Frankly, I particularly liked the looks of one of these latter types I saw on the West Coast, but did not talk with anyone who had operated one for sufficient length of time to advise about maintenance and knife costs.

Hay may be pelleted in long chops (¾ in. to 1 in. length) but at some reduction in capacity and pellet quality as compared to the pellet made from hay ground over a ¼ in. or 3/16 in. screen.

Therefore, a shredder is recommended. If only a 50 h.p. pellet mill is to be used, it may be that a good shredder, with a ¼ in. screen, and 75 h.p. motor will be all the grinding you need on good quality alfalfa. However, if quality of hay is poor, and/or if a larger pellet mill is to be used, you should plan on both a shredder and a hammermill. Under this arrangement, the shredder may be equipped with a 1 in. screen, and the hammermill with a ¼ in. or 3/16 in. screen. Horsepower on shredder and hammermill will have to be determined based on quality of hay to be handled, capacity and fineness of grind desired.

Hammermill as well as the shredder may be located in the hay storage building and the ground hay blown across to the roughage bins inside the mill, or the shredder may blow chops across to the hammermill located inside the mill building. Insurance rates will normally determine the locations of the hammermill.

A stone trap should in any case be incorporated into the shredder, and magnetic protection above the hammermill is recommended.

A variable speed drive should be used for the drag feeding the shredder, so rate of feed can be adjusted

(Turn to page 58)

Oak B. Smith

AUTHOR—Oak B. Smith is director of market research for the Wenger Mixer Manufacturing Co. of Sabetha, Kansas. Mr. Smith's office is in Kansas City. He joined the Wenger firm in 1950 as manager of the export division, later becoming sales manager. He was named director of market research in 1958. Mr. Smith has investigated extensively the possibilities for pelleted complete rations, including roughage, for cattle and sheep, and has done a considerable amount of work in planning facilities for handling, processing and pelleting hay and complete pelleted rations based on hay.

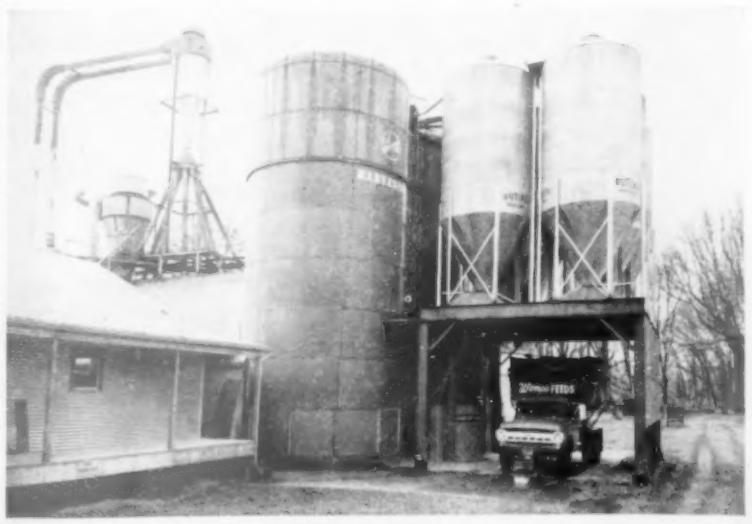


FIGURE 5. Bulk loading facilities of the Western Oregon Milling Co. at Philomath, Ore. In the background are feedlots where cattle are fed complete pelleted rations based on hay.

SUPERIOR BIOLOGICAL NOPCAY® CONFIRMED BY INDEPENDENT

YOU GET MORE FOR YOUR MONEY WITH NOPCO'S NEW MICRATIZED® VITAMIN A

From the feeder's point of view the real test of a vitamin A product is its effectiveness in the digestive tract. The most common method of demonstrating the degree of this is to feed high levels of vitamin A and measure liver storage. It has the advantage of giving conclusive evidence of such factors as digestibility, availability and utilization.

Independent research laboratories confirm the superior biological effectiveness of Nopcay Type V. Published herewith are results of studies by two such laboratories—Lime Crest Research Laboratory, Newton, N.J., and a West Coast research laboratory. Incidentally, their widely separated locations also provide data on the effect of climate and environment.

LIME CREST RESEARCH LABORATORY

Experimental Procedure

One-day-old male chicks of the Nichols strain of New Hampshires were randomly distributed into duplicate lots. Control lots were fed a basal diet which was devoid of vitamin A or its precursors. Other lots received 4800 USP units of vitamin A from Nopcay Type V, dry product "X", fish liver oil, and alfalfa meal.

RESULTS: Liver Storage of Vitamin A (5-week-old chicks)

PRODUCT	VitaminA Added (USP units/ lb. of diet)	Vitamin A Ingested at End of 5 Weeks (USP units)	Liver Storage –Vitamin A Activity– (USP units)	Vitamin A Stored Compared to Amount Ingested (%)
Nopcay Type V	4800	12,653	4613	36.5
Dry product "X"	4800	12,648	3193	25.2
Fish liver oil	4800	12,350	3444	27.9
Alfalfa meal	4800	12,504	1176	9.4

The differences in liver storage between chicks fed Nopcay Type V and the other vitamin A sources are highly significant. Since all chicks ingested approximately the same amounts of vitamin A, the improved utilization of Nopcay Type V is attributable to improved biological effectiveness.

If we compare the amount of vitamin A stored in the liver of chicks fed Nopcay Type V with the amount stored by those fed the other products, we find that the Type V birds stored 30.8% more than dry product "X"; 25.3% more than fish liver oil; and 74.5% more than alfalfa meal.

Basic producers of Micratized® Vitamins A and D, niacin,

EFFECTIVENESS OF TYPE V RESEARCH LABORATORIES

A WEST COAST RESEARCH LABORATORY*

Experimental Procedure

One-day-old White Rock male chicks were used in this experiment. Apart from this difference, the test procedure was the same as that of Lime Crest. Alfalfa meal was not used as a source of vitamin A in this study.

RESULTS: Liver Storage of Vitamin A (5-week-old chicks)

PRODUCT	VitaminA Added (USP units/ lb. of diet)	Vitamin A Ingested at End of 5 Weeks (USP units)	Liver Storage –Vitamin A Activity†– (USP units)	Vitamin A Stored Compared to Amount Ingested (%)
Nopcay Type V	4800	12,718	3057	24.0
Dry product "X"	4800	12,868	1050	8.2
Fish liver oil	4800	12,867	1306	10.1

**Name on request.*

†Day-old chicks averaged 38 USP units of vitamin A per liver.

The groups fed Nopcay Type V stored an average of 3057 USP units of vitamin A per liver; those fed the dry product "X," 1050 USP units; those fed fish liver oil, 1306 USP units. These data confirm previous reports which indicated that vitamin A from fish liver oil and certain dry products was poorly utilized as compared to vitamin A from Nopcay Type V. The table shows the amount of vitamin A ingested by all three lots. It further shows the percentage of vitamin A stored as compared to the amount ingested. It can readily be seen that the intake of vitamin A on all three lots was essentially the same. However, the percentage of vitamin A stored in the liver by the Nopcay Type V groups compared to the amount consumed was approximately 24%. On dry product "X" it was only 8.2% of that ingested; on fish liver oil, only 10.1%.

SUMMARY

When the level of vitamin A stored is compared to the amount ingested, we find that 24% of Type V is stored, 8.2% of product "X," and 10.1% of fish liver oil. This work substantiates previous studies concerned with the improved utilization of Nopcay Type V over other forms of vitamin A.

There are significant differences in the biological effectiveness of vitamin A products. These studies confirm our previously reported findings on the subject.

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to the horsepower of the shredder, and modulated to the capacity of the hammermill.

Mixing Ground Hay with Other Dry Ingredients: Two arrangements seem usable in roughage pelleting—the continuous mixing line or the batch system. While the continuous mixing line is probably adequate for the feed mill producing only feed for its own feed yard, it will not have the flexibility needed for custom milling operations unless a rather considerable investment is made in bins and feeders. For this reason, I believe the batch system is the one which will be used in the majority of country feed mills, whether or not they offer a custom service.

For this reason, we will consider only batch plants in this layout.

To feed ground alfalfa to any mixer is not an easy job. It is light (weighing 16-24 lb. per cu. ft. when dry); it wants to bridge in a bin, and to be generally uncooperative with most feeders. For these reasons, we recommend that ground hays be handled in vertical square or rectangular bins (without hoppered bottoms), using a live bottom bin feeder across the whole width and length of the roughage bin. This feeder should have an individual electric motor, controlled by push button.

Ground grains, soft feeds and proteins may of course be handled in hoppered bottom make-up bins. Two sides of such bins should be vertical, and these at right angles to each other. The other two sides may be hoppered (60° above the horizontal sufficient for most ground grains and proteins, but 65° above horizontal recommended for millfeeds).

Horizontal batch mixers will normally handle ground hays and do a reasonably good job of mixing them with grains, proteins, etc. Vertical batch mixers are also built in special configurations to handle ground hay, and seem quite satisfactory in these special configurations. Normally, a hay mixer (both horizontal and vertical) will require about 5 h.p. more power than normally recommended for that size mixed with normal dry feeds. Explanation here is that hay often contains considerable moisture.

Mill Layouts for Complete Pelleted Rations Based on Hay: Arrangements may vary from the simplest to a much more elaborate installation.

Shown in Figure 3, for example, is a simple layout for the custom shop which will receive and grind only grains and alfalfa; will mix them with bagged concentrates supplied by others; will blend this mixture with molasses; pellet, cool, and deliver either in bags or bulk. It will be noted that this is a custom mill in every respect of the term—the mill furnishes the usual custom functions of receiving, grinding, mixing and molasses application, plus pelleting, cooling and bulk deliveries. In all this, the small custom shop relies on the nutritional advice and the concentrates supplied by the major manufacturer of formula concentrates. Today, most such suppliers deliver to the custom shop only in bags. However, bulk deliveries of premixes to such mills may be anticipated, and plans made initially for bulk premixes.

It will be noted that neither Figure 3 nor Figure 4 stipulate amount of grain storage or concentrate storage since these will vary depending on local requirements.

Shown in Figure 4 is a more comprehensive layout for a country mill desiring to produce a reasonably full line of formula feeds, including hay-based pellets, in its facilities.

In between these mills, and beyond, lies a host of possible modifications. These layouts will simply show two approaches to the problems of a minimum custom mill and a reasonably complete country mill. I laid them out with the thought that both represented a reasonable approach to the problem, and that both represented a minimum of equipment needed to do the job at hand with reasonable efficiency.

Pelleting Straight Hay and Complete Pelleted Rations Based on Hay: Good quality hay will pellet quite well, and many poorer quality hays will make a satisfactory pellet. Like all other ingredients to be pelleted, the finer the grind, the better the pellet. However, grinding costs go rather high on fine ground hay, and a grind of ¼ in. or 3/16 in. will normally produce a pellet which will stand up well, especially when pelleted with molasses.

Some hay can be pelleted without grinding, if chopped over a ¾ in. screen, particularly when the chops are wilted fresh alfalfa chops, fairly high in moisture content. However, there will be some loss of quality, and some loss in capacity when chops are pelleted, so a grind as above is recommended.

Steam requirements in pelleting straight alfalfa are quite low, since moisture content of the alfalfa is reasonably high. Indeed, when 5-10% molasses is mixed with ground good quality alfalfa, no steam may be required at all. However, poorer quality hays will require some steam conditioning. Also, some nutritionists believe that a growth inhibitor exists in raw grains, and that the partial cooking available when pelleting with steam has diminished the activity of this growth inhibitor. It seems probable, therefore, that the partial cooking with steam may be in part responsible for the improved growth responses obtainable when feeds are pelleted. Therefore, steam is recommended in all pelleted operations, including this one in which it is often possible to use only small amounts of steam.

Die selection will of course vary with formula, type of hay and size of pellet to be produced. In general, however, you may anticipate dies might have about the following effec-

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tive hole length for various types of alfalfa:

(1) Straight alfalfa, ground over 3/16 in. screen—1¼ in. effective hole.

(2) 60% ground alfalfa, 30% ground grain, 10% molasses—2 in. effective hole.

(3) 20% ground alfalfa, 75% grain, 5% molasses—2½ in. effective hole.

Pellet mash bins should be equipped with oversized bottoms, in our opinion, to minimize the hazard of bridging in the bin above the feeder. For example, for most pelleted rations, we use a feeder inlet 23 in. long. For the pelleted hay ration, we suggest a feeder extension so opening is 46 in. long, with anti-bridging agitators above feeder the full 46 in. length. This oversized feeder will permit larger bins when headroom is at a minimum.

Molasses may be applied to this ration at reasonable levels (5%-20%, depending upon absorbency of ingredients in the formula). Molasses should be applied at 105°-130° F. in high speed mixers. The maximum level of molasses will give a better binding and a more adhesive pellet.

Cooling hay pellets may be a little more difficult than cooling pellets of the same size based on grains. This is particularly true where high moisture hay is used. Also, if pellets are to be stored in bulk, it is well to be sure of adequate cooling, and more retention time should be provided in the cooler for range cubes than will be required for bunk pellets.

I believe that ⅜ in. size may prove to be the optimum size for bunk pellets and self feeders, although smaller pellets may be used.

Handling Pellets in Bulk: Well dried and cooled hay pellets, or complete pelleted rations based on hay, will handle well in bulk. In general, it is believed such pellets should be elevated in oversized cups, moving as slowly as possible, and pellets should be loaded on the up side. Spouts from discharge of legs to bulk bins should be on 45° slope. Bulk bins will have less tendency to bridge if they have two vertical sides (vertical sides at right angles to one another) and the two hoppered sides approximately 50° above the horizontal.

Most bulk trucks and mechanical offloading equipment will prove satisfactory for handling hay pellets, and it appears that most of them will be handled in bulk trucks, or flatbeds equipped with mechanical offloading equipment. When pelleted rations are handled in bulk trucks, offloaded into self feeders in the feed lots, and fed to cattle or sheep through these self feeders, the labor almost disappears from feeding operations. (See Figure 5.)

One West Coast feed yard has fed 30,000 sheep with two men, using such self feeders and bulk pellet unloaders.

Self feeders should be designed with adjustable openings between the bin and the trough. It is recommended that the feed trough should be fairly narrow, that the trough be sloped 40°-45° from side of trough towards feeder tank. This will minimize the amount of pellets which runs out onto the trough. If the flat bottom of the trough is only a few inches wide (4-5 in.), the cattle or sheep will eat almost all of the pellets. If this flat bottom is made wider (8-12 in.), then some pellets will run toward the outside and will be left there as the ruminant prefers the pellet which has not been exposed to the air. We believe also that drainage should be built into the trough of the self feeder, and that an eave over this trough is desirable to keep water out of the trough. Feeders may be round or rectangular, should be equipped with manholes 18-24 in. in diameter so pellets may be easily spouted into feeder, and so that a can can get inside for clean-out of feeder from time to time.

It appears that pelleted hay rations have materially upgraded hay as a feedstuff, that rates of gain on pelleted hays are good, that feed costs per pound of gain are low, that labor in feeding can be substantially reduced if cattle and sheep are fed from self feeders and if mechanical offloading equipment is used to transport bulk pellets from feed mill to feed lot. There are indications at least that feed efficiency may be improved further, and costs of gains lowered, by furnishing a complete pelleted ration to the critters.

Obviously then, this is another area in which the feed industry can expect substantial increase in concentrate business, and locally important tonnages. Similar developments in the swine feeding field may prove important as well.

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Research Reports Given at Montana's Annual Beef Cattle Feeders Field Day

BOZEMAN, MONT.—Experiments involving the effect of Dynafac and stilbestrol implants with completely pelleted cattle fattening rations, and the effect of adding phosphorus and vitamin A to supplements fed weaned calves on winter range were reported recently in Montana.

Other reports were given on feed additives, cattle grub control and rations for steers on irrigated pastures at the third annual Beef Cattle Feeders Field Day at Montana State College. More than 150 cattle producers attended the event.

In presenting a progress report on feeding Dynafac and stilbestrol implants with completely pelleted cattle fattening rations, Dr. O. O. Thomas and Harley Jordan, department of animal industry and range management, pointed out that although there are only a few cattle feeders in Montana using completely pelleted rations for fattening cattle, there is considerable interest in the subject.

"Pellet feeding goes hand in hand with automatic or mechanized bulk handling and feeding. Therefore, the feeder who uses completely pelleted rations must compensate for the cost of pelleting by increased, more efficient animal gains, saved labor and handling costs," it was stated in the research report.

Dynafac and a stilbestrol implant were used in combination in one lot of cattle because of the weight-gain response they gave in steers on a recent trial.

Experiment Setup

In the experiment, 40 yearling Hereford steers were divided on the basis of previous winter treatment into five lots of eight head each. Each lot of steers was randomly assigned to a pen for feeding. They were started on feed on May 22, at which time they averaged 522 lb., and were weighed at 28-day intervals during the trial. (The first 112 days of the test had passed when the report was given.)

FEED TEST—Examining pellets containing Dynafac, fed fattening cattle in tests at Montana State College, are (left to right): Dr. M. R. Schooley, director of animal health and nutrition for Armour & Co., Chicago, Dr. O. O. Thomas, department of animal industry and range management at Montana State College, and Dr. William H. Burkitt, director of nutrition for the Montana Flour Mills Co. The experiment involved the effect of Dynafac and stilbestrol implants with completely pelleted cattle fattening rations. A progress report on the work was presented at the recent Beef Cattle Feeders Field Day.

All steers were hand-fed for about 10 days and then self-fed the remainder of the trial. The steers were self-fed the various rations as follows: Lot 1, loose grain mixture and alfalfa hay; lot 2, completely pelleted ration; lot 3, completely pelleted ration and straw, and lot 4, completely pelleted ration plus Dynafac and straw. Lot 5 steers were fed the same as lot 4 steers except that these steers were implanted with 36 mg. of stilbestrol at the start of the trial.

For the first 112 days of the test (May 22-Sept. 11), average daily gain in pounds was 2.98, 2.84, 3.09, 3.25 and 3.49 for lots 1-5 respectively. Total costs of feed per 100 lb. of gain for lots 1-5 were: $12.03, $14.85, $14.13, $15.01 and $14.43.

Phosphorus, Vitamin A

Dr. Thomas reported that the tests on phosphorus and vitamin A have been in progress for the past three years. "Although the weight gains were not as great as in the previous two years, the addition of vitamin A and phosphorus together increased gains. During the previous two years, the addition of either phosphorus or vitamin A increased gains. It is evident that in a severe winter calves could not be wintered on range grass alone," Dr. Thomas said.

He added that summer gains of

(Turn to FIELD DAY, page 83)

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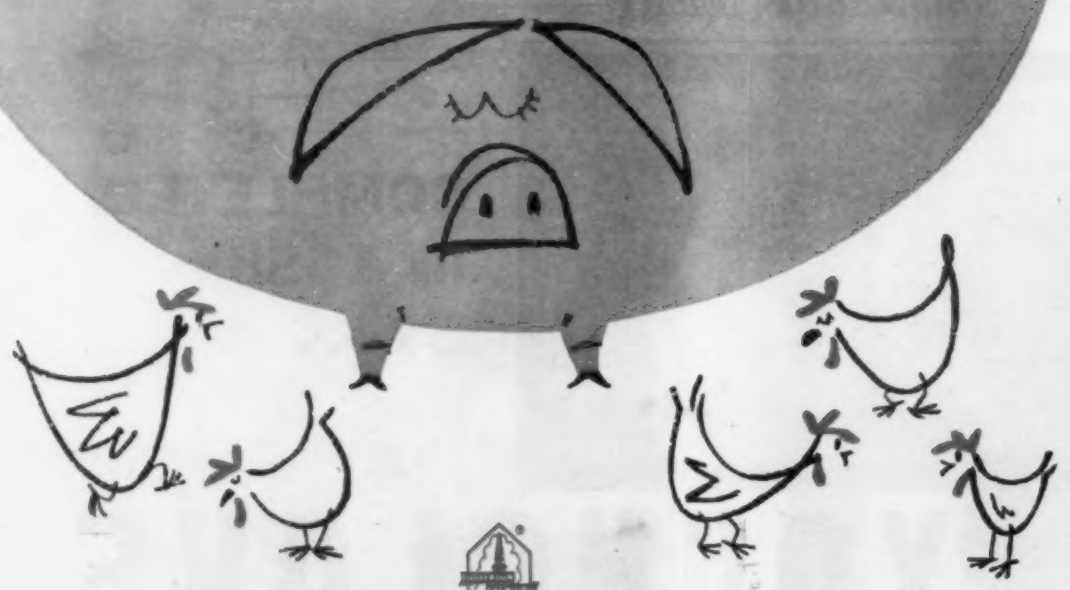

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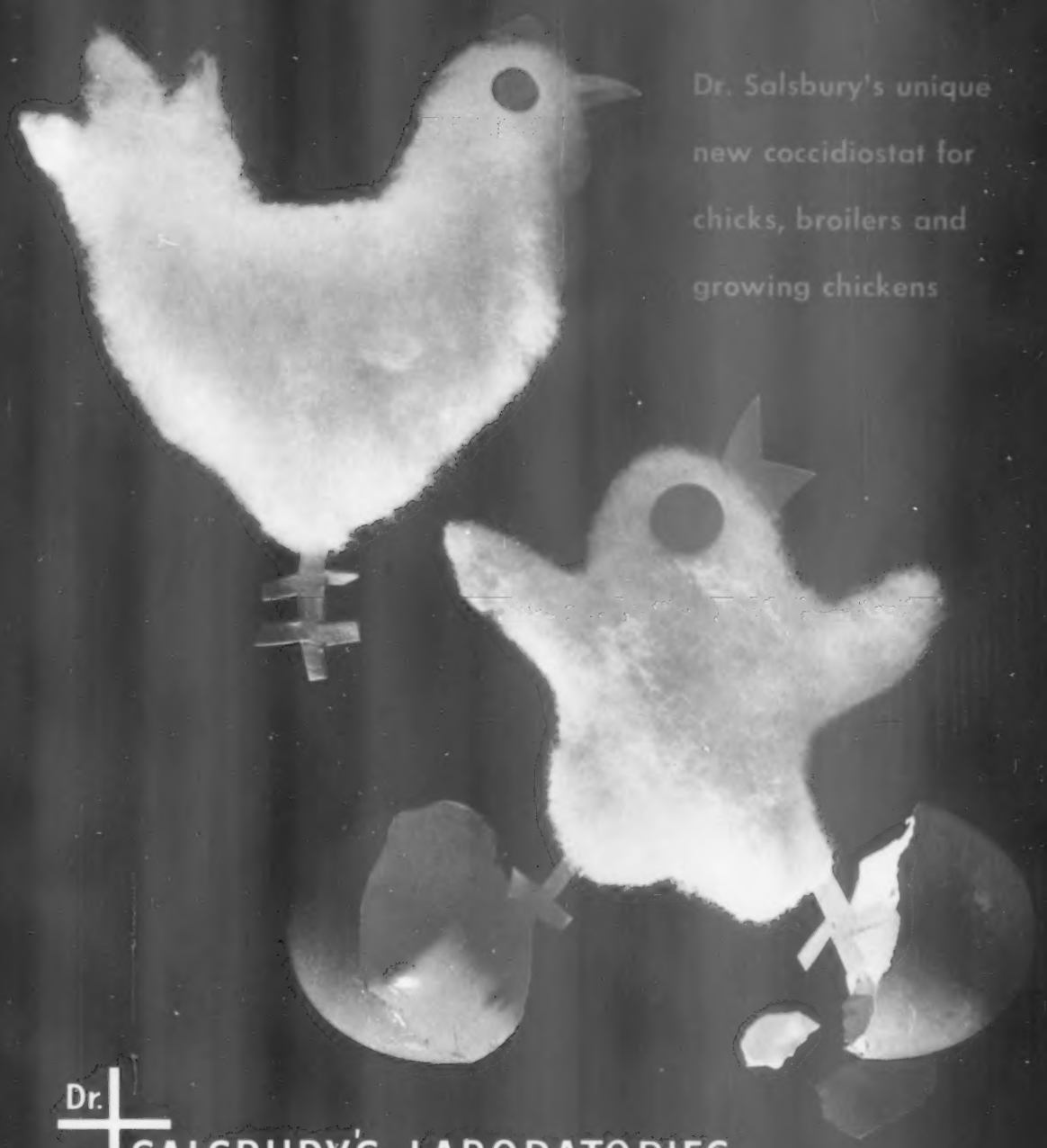

Dr. SALSBURY'S LABORATORIES

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Growers say Unistat is best coccidiostat yet...

The true value of any new poultry health product is never really known until it has been widely used in the field—under all kinds of conditions. **Grower experience is what counts.** Growers must **know** that Unistat not only controls coccidiosis but does so at a substantial profit to them. Then and only then should you use it in your feeds. Unistat has now been fed to more than 100 million birds. The following are typical of many letters being received at Dr. Salsbury's Laboratories from large commercial poultrymen (names on request).

DELAWARE

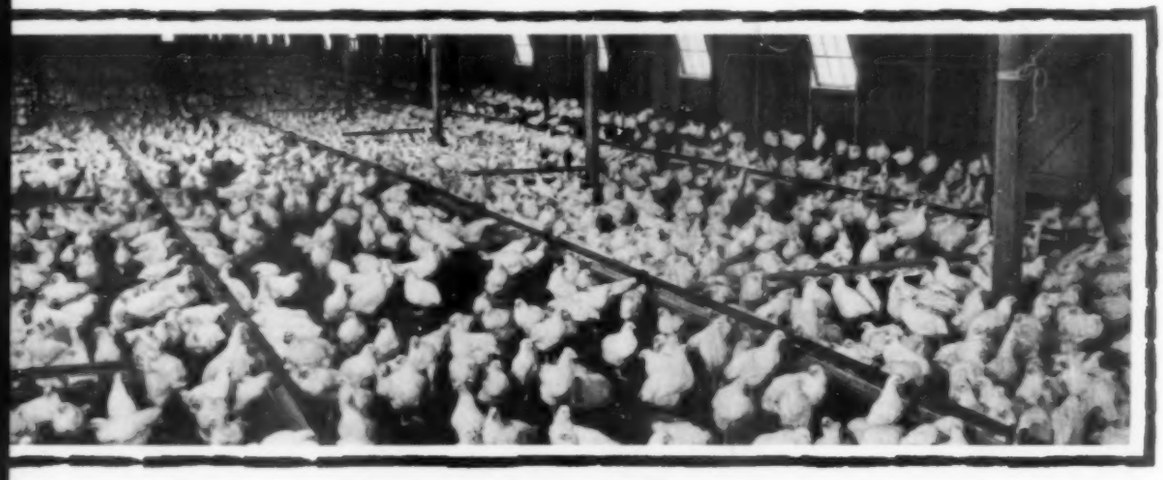
"Our feed efficiency has improved more than 10 points over the same period of last year while coccidiosis has not been a problem with us. We feel that the pigmentation, finish, and quality of our birds has been greatly improved with Unistat feed. Unistat is now in our ration 100%, but we field-tested a number of coccidiostats before we made this change." (This is from an independent grower raising 1,000,000 birds a year.)

NORTH CAROLINA

"This is the first flock of broilers I have ever grown without trouble from coccidiosis. These birds had better color than birds grown before. I am completely satisfied with the results I have gotten from Unistat." (The flock referred to had a feed conversion of 2.33—or, 43 lbs. of meat per 100 lbs. of feed. Birds were sold at 9 weeks and 6 days of age; average weight was 3.61 lbs.)

GEORGIA

"I switched my entire operation to Unistat in February, 1958. Since making this switch, I have had less trouble with coccidiosis, with resulting better weights and lower feed conversions. The broilers I am marketing show a definite improvement in pigmentation and quality. Medication costs since February have been less than at any comparable period since I have been in business." (This operator feeds out an average of 80,000 broilers a week.)



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No major feed company has ever withdrawn Unistat from its feed

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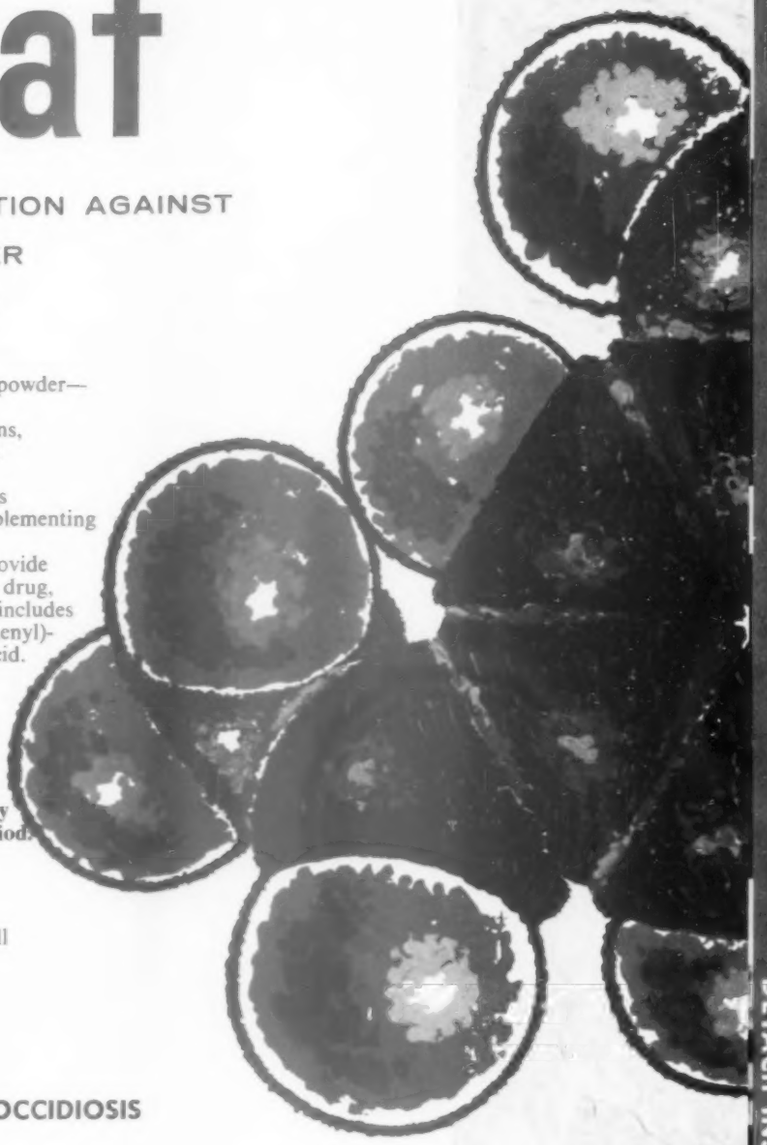
Unistat is a yellowish, free-flowing powder—a feed additive that blends easily. It is compatible with minerals, vitamins, antibiotics and other normal feed ingredients. Chemically, Unistat is a unique combination of active ingredients—drugs chosen for their specific effect in complementing each other. They work together as a team, so that this new coccidiostat is able to provide far more protection than any single drug, chemical complex or compound. Unistat's formula includes 3,5-Dinitrobenzamide, Acetyl-(paranitrophenyl)-sulfanilamide, and 3-Nitro-4-hydroxyphenylarsonic acid.

Unistat is recommended for coccidiosis prevention, growth stimulation, improved feed efficiency, and better pigmentation in chicks and growing chickens. **Use at the rate of 1 lb. per 1,000 lb. of an all-mash ration. Give Unistat for starting baby chicks and continue through the growing period.**

3,5-Dinitrobenzamide, a relatively new organic compound, along with the other active ingredients of Unistat, makes this product highly effective against all major economic species of coccidia.



- PREVENTS COCCIDIOSIS
- PERMITS IMMUNITY
- STIMULATES GROWTH
- INCREASES FEED EFFICIENCY
- IMPROVES PIGMENTATION

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coccidiosis

A TRIPLE THREAT TO POULTRY PROFITS

Coccidiosis is one of the commonest and costliest of all poultry diseases. It causes annual losses of many millions of dollars. All ages and kinds of flocks are susceptible—baby chicks, pullets, broilers, and layers. Prevention is the best way to protect birds—and profits. Three kinds of coccidiosis cause the most loss. All belong to the genus *Eimeria*. And all are microscopic, single-celled organisms.

1. **E. tenella.** This is the cause of bloody cecal coccidiosis and can kill birds. It occurs mostly in young chicks and is especially deadly after the first two weeks. Birds huddle, their heads drawn in, their feathers ruffled. Bloody droppings are a well-known symptom.

2. **E. necatrix.** This organism causes acute or bloody intestinal coccidiosis. Death losses are frequently quite high. General symptoms are about the same as for cecal coccidiosis (described above) except for ballooned intestines filled with bloody mucus.

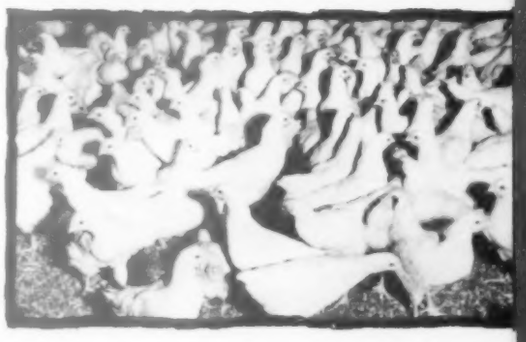
3. **E. acervulina.** This coccidium is the most common. It may cause chronic intestinal coccidiosis or the disease may be acute, causing growing chicks to lose as much as 40% of their body weight in 4 or 5 days. In either case, it is characterized by general unthriftiness among birds. Although mortality is usually low, birds are slow to regain thriftiness. Many of the serious outbreaks during the rainy season of 1958 were caused by **E. acervulina.**

field trials and laboratory tests prove

UNISTAT'S EFFICACY

Unistat was tested under the most rigorous laboratory conditions to determine its efficacy as a coccidiostat and its other effects on birds. The table below shows that Unistat, under experimental conditions, was highly effective in preventing mortality due to the three types of coccidiosis that cause the most economic loss. Unistat substantially maintained normal droppings and test birds enjoyed good comparative weight gains in the presence of massive infection. Complete data on this and other tests are contained in Unistat Feed Manufacturer's Guide, available from Dr. Salsbury's Laboratories (see order form on inside back cover).

Widespread field trials confirmed these test results. Millions of birds have now been fed out on Unistat. Grower experience and records indicate that under varying conditions—weather, infection, feed, etc.—Unistat provides a high degree of protection against the important forms of coccidiosis. You can use it with confidence. It has been proved on more than 100 million birds.



EFFICACY OF UNISTAT (0.1% IN FEED) IN THE PREVENTION OF COCCIDIOSIS DUE TO EIMERIA TENELLA, E. NECATRIX, AND E. ACERVULINA

Species of Coccidia	Number of tests	Number of Chicks Used			Coccidiosis Mortality			Gains as percentage of noninfected control	Comparative Droppings Score (%)
		IM	IC	UC	IM	IC	UC		
E. tenella	10	54	56	56	0	21	0	99.8	68
E. necatrix	11	78	79	79	11	56	0	47	47
E. acervulina	7	39	40	40	0	17	0	86	100

IM: Medicated-Infected; IC: Nonmedicated-Infected; UC: Nonmedicated-Noninfected.

Proved effective against all 3 species under exacting laboratory conditions

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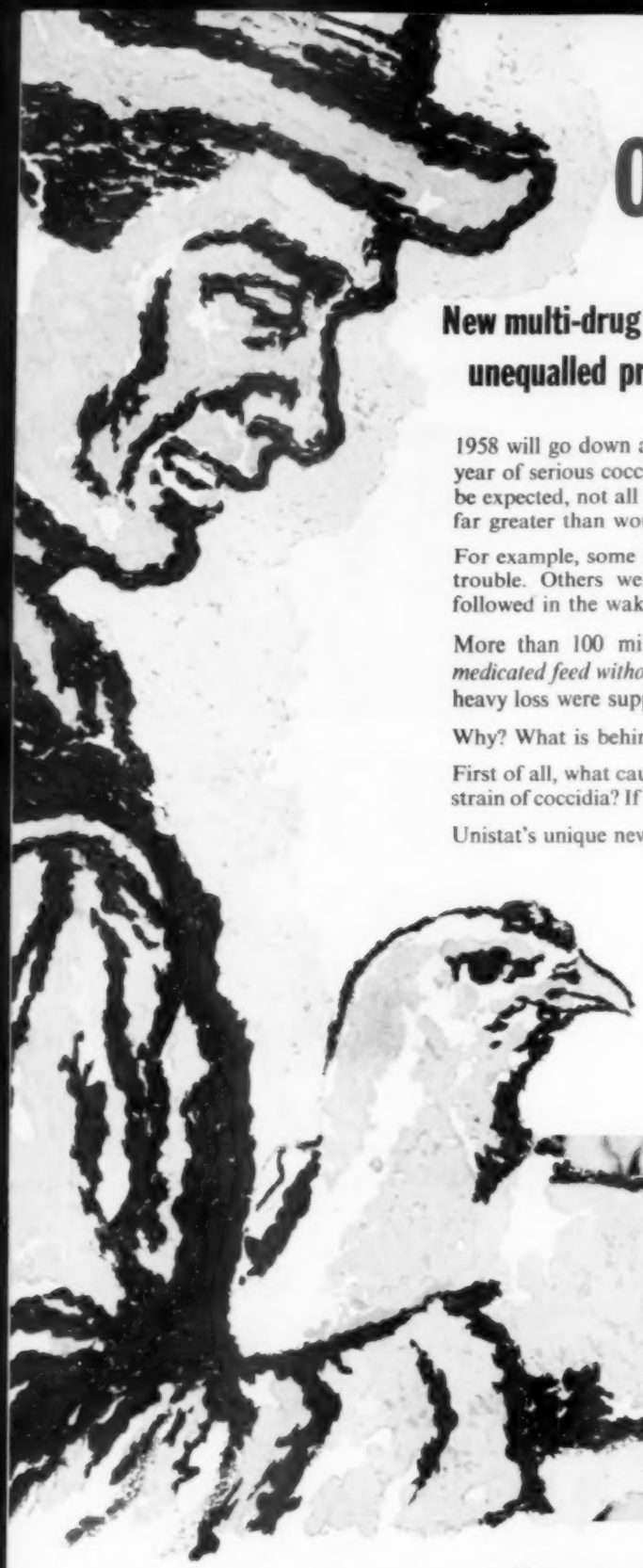

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New multi-drug formula, fed to over 100 million birds, gave unequalled protection during months of rainy weather

1958 will go down as one of the wettest years in recent history. Also, it was a year of serious coccidiosis outbreaks during the spring and summer. As would be expected, not all flocks were affected similarly. The difference, however, was far greater than would be expected by chance alone.

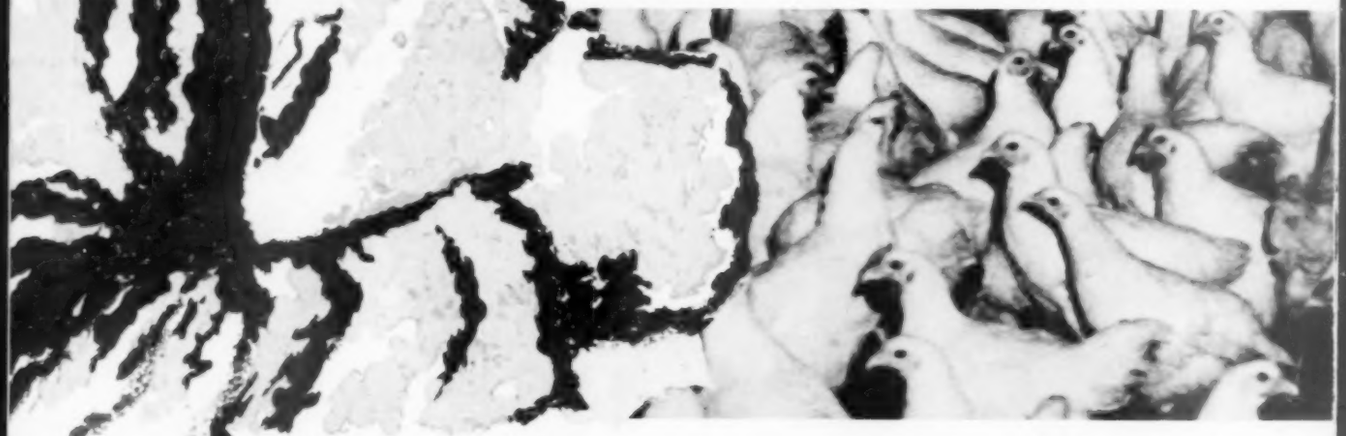
For example, some flocks went through the rainy, humid weather without any trouble. Others were decimated. During the dozens of investigations that followed in the wake of these losses, one fact stood out:

More than 100 million chicks and growing birds were *raised on Unistat-medicated feed without serious outbreaks*, while many of the flocks that suffered heavy loss were supposedly protected by other feed additive coccidiostats.

Why? What is behind these significant differences in efficacy?

First of all, what caused the breaks? Was it weather—and an unusually virulent strain of coccidia? If so, why didn't the Unistat flocks get hurt the same as others?

Unistat's unique new formula is the difference. Unistat contains a combination of active ingredients because *no compound, complex or other single chemical entity has been found to be equally effective against all important species of coccidia in chickens.* But Unistat, with its unique multi-drug character, is highly effective against all major economic species—making it of maximum value to the poultryman, which is the main reason for its growing popularity this year. And this, in turn, is why you'll want Unistat in your poultry feeds.



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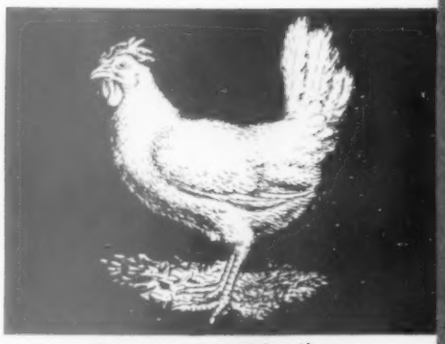
Balanced protection permits birds to develop their own immunity

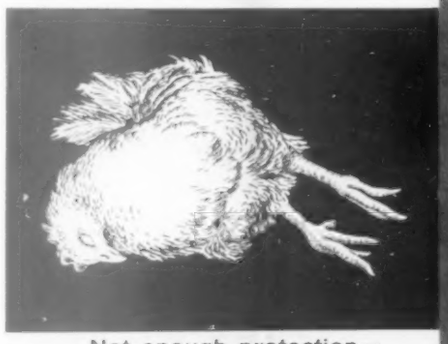
Unfortunately, many coccidiostats protect birds only while the drug is being fed. That is, these drugs prevent the disease so completely that birds cannot develop their own lasting, natural immunity. Thus any gaps in drug administration pose an unnecessary disease loss risk.

All these points are evident in grower demands for a coccidiostat that not only prevents death loss in exposed birds but also permits birds to develop immunity through a controlled, sub-clinical infection. *Unistat meets this exacting requirement precisely.* It lets birds have a mild infection, just as a small-pox vaccination causes a mild form of that disease to humans. In much this same way, Unistat enables birds to acquire specific immunity when exposed to infection while receiving the medication—thus preventing the disease after the medicated feed has been discontinued.

Unistat offers no miracle . . . But it does give growers the economical *balanced* protection they are looking for.



Too much protection—
NO IMMUNITY



Not enough protection—
DEAD BIRD

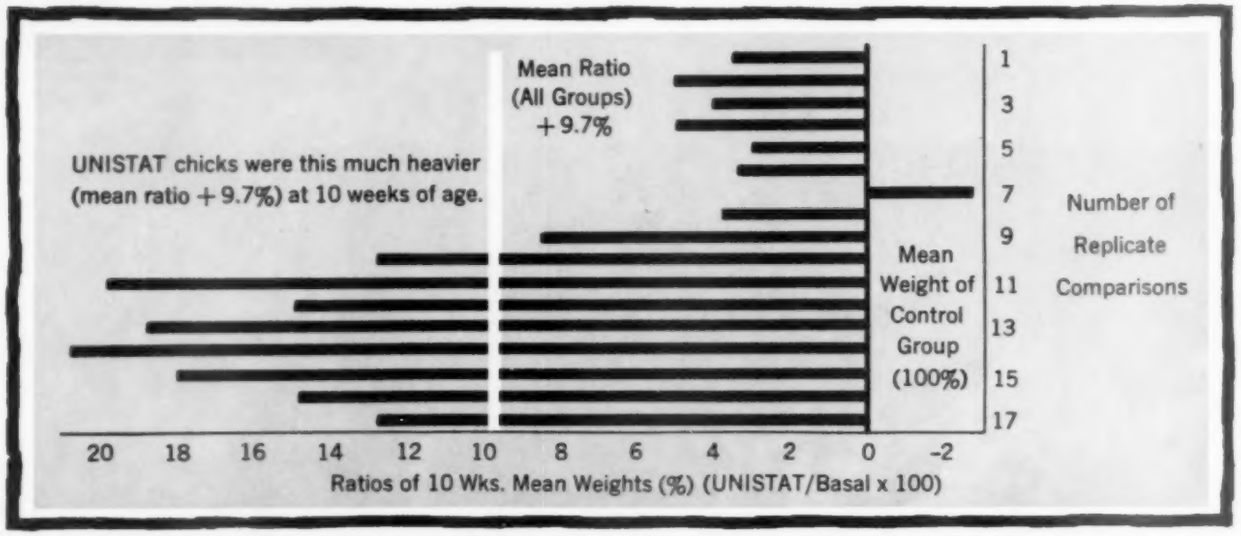
DETACH INSERT AND FILE

feeds this extra protection

FOR TOP PROFITS,

1. grow faster

Fast growth is necessary to highest profits. Extensive tests, conducted by Dr. Salsbury's Laboratories and supported by field trials in commercial flocks all over the country, have shown that Unistat provides this all-important profit benefit. In one series of tests, a total of more than 6,000 broiler-type chicks were fed the basal ration, which contained an antibiotic, and their growth compared to a like number with Unistat in their ration. The bar chart shows the stimulated growth rate of the Unistat chicks—**they were 9.7% heavier at the end of 10 weeks.** Unistat was also fed for 10 weeks to replacement-type chicks confined in brooder houses. At the end of the test period, they were 11.2% heavier than the birds on the basal ration. Field trials, involving many thousands of broiler birds, have confirmed these test results. Your growers can expect a very profitable increase in growth rate from the use of feeds containing Dr. Salsbury's Unistat.

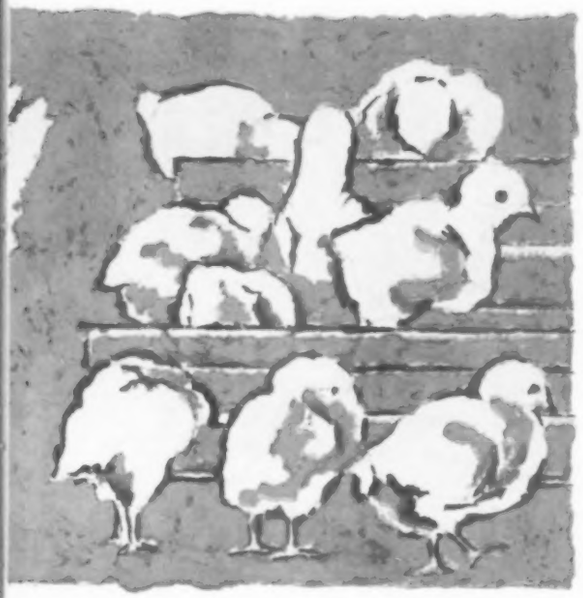


these are only **2** of the many reasons why

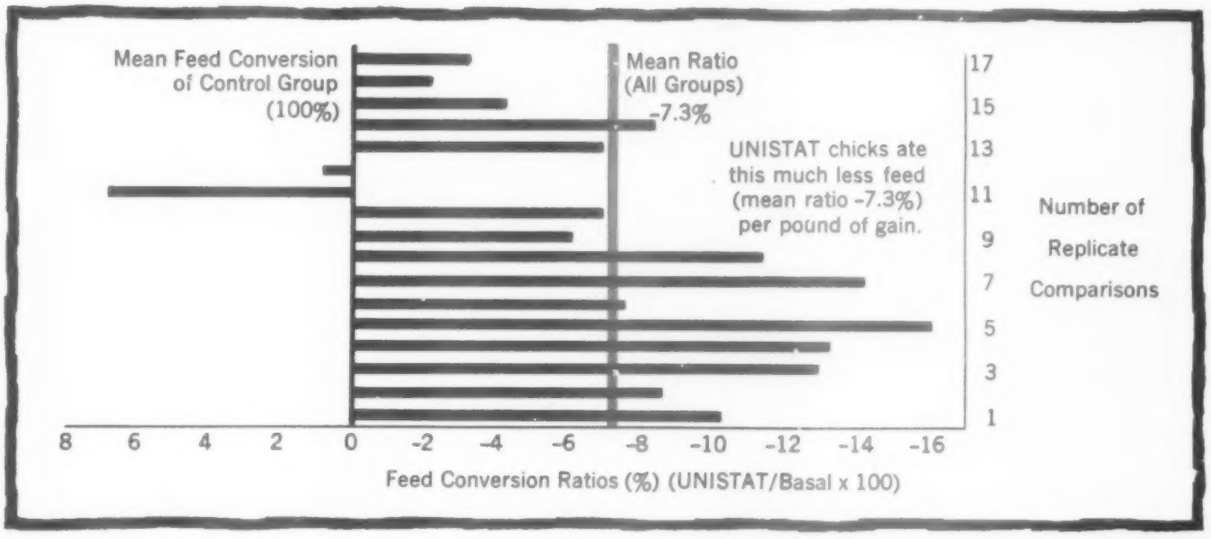
MORE AND MORE GROWERS

UNISTAT-FED BIRDS

2. need less feed

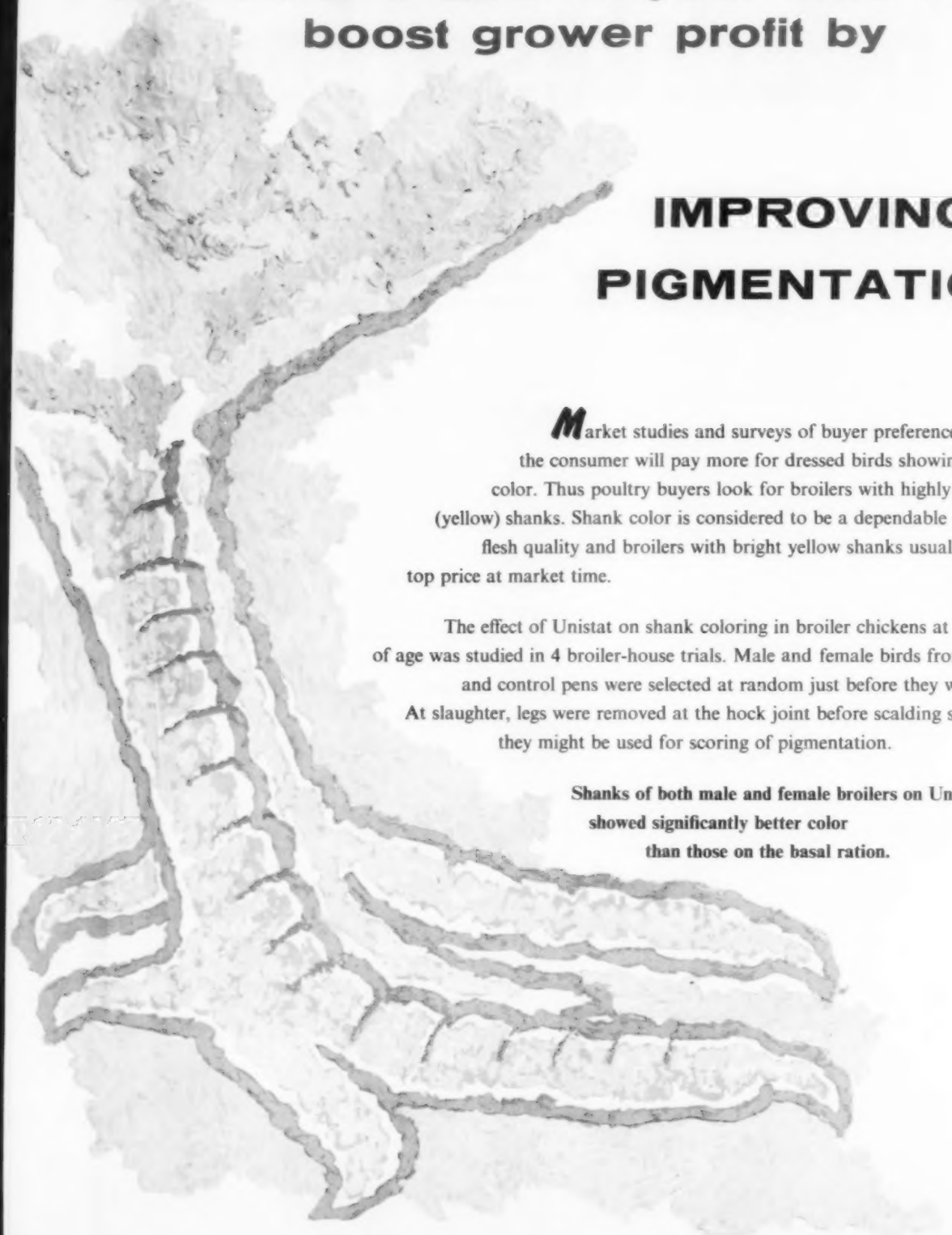


Feed efficiency is even more necessary to profits than fast growth. Birds must somehow make top gains per pound of feed. Here again, exhaustive tests probed into Unistat's side effects, long before it was available on the market. Seventeen pens of broilers were studied at Dr. Salsbury's Research Farm under semi-commercial conditions. Over 13,000 broiler birds were used, with approximately half getting Unistat-medicated feed. The others received a commercial broiler mash (containing an antibiotic) as the basal ration. All birds were sold at 10 weeks. The accompanying bar graph shows the results of this experimental work. **The Unistat broilers needed 7.3% less feed per pound of gain.** Field trials were also conducted in the commercial broiler areas. Nearly 165,000 birds were involved. These, too, showed faster gains and a marked reduction in feed per pound of gain. **These reduced feed requirements, added to all the other benefits of Unistat, can materially increase your growers' profits.**



DEMAND UNISTAT IN THEIR FEEDS

Unistat in your feed helps boost grower profit by



IMPROVING PIGMENTATION

Market studies and surveys of buyer preference indicate that the consumer will pay more for dressed birds showing lots of color. Thus poultry buyers look for broilers with highly pigmented (yellow) shanks. Shank color is considered to be a dependable guide to flesh quality and broilers with bright yellow shanks usually bring top price at market time.

The effect of Unistat on shank coloring in broiler chickens at 10 weeks of age was studied in 4 broiler-house trials. Male and female birds from both treated and control pens were selected at random just before they were sold. At slaughter, legs were removed at the hock joint before scalding so that they might be used for scoring of pigmentation.

Shanks of both male and female broilers on Unistat showed significantly better color than those on the basal ration.

Let Dr. Salsbury help you build better poultry feeds

Because of your desire to provide superior feeds for your customers, you may wish detailed information about this new coccidiostat . . . about this new milestone along the road to profitable poultry production through more effective feed medication. Or, you may wish to talk personally with a Dr. Salsbury technical service adviser and ask him about using Unistat in feeds for starting-growing chickens. Use handy self-mailer order blank below for speedy reply to your request. Regardless of your size or location, we will gladly help you build better poultry feeds. For, in the long run, our future depends on your success!

THESE FREE SERVICES ARE YOURS FOR THE ASKING

AUTHORITATIVE COUNSEL. Available to you is the counsel of more than a score of Dr. Salsbury's scientists in the fields of poultry and animal health, chemistry, microbiology, protozoology, and helminthology, working with the most modern equipment in one of the largest commercial poultry—and animal—health laboratories in the world. These experts are at your service for any advice you may need regarding feed medication.

PATHOLOGICAL SERVICE. Dr. Salsbury's Laboratories offer you the professional diagnostic opinion you may need for providing the proper medicated feeds to cope with unusual flock health problems.

TECHNICAL SERVICE ADVISERS. A group of trained specialists, experienced in feed medication, will come and confer with you. They bring the entire technical resources of Dr. Salsbury's Laboratories to your aid.

SERVICE TRAINING COURSE. Dr. Salsbury's Laboratories have over 25 years' experience in training dealers, field servicemen, and poultrymen in the essentials of poultry health. Short courses in poultry, broiler, and turkey subjects—taught by leading scientists and educators—can help your staff render a better service.

SCIENTIFIC INFORMATION SERVICE. An extensive series of Feed Manufacturers Guides, bulletins, and reports of research covering practically every field of poultry health, will be sent to you regularly.

FIELD SERVICE. One-fourth of Dr. Salsbury's total staff—or about 100 men—are constantly in the field, providing service. These men have an average of 12 years' experience with the Laboratories. They know poultry, and they are always ready to assist you with feed medication.

Please send me the following:

- ☐ Feed Manufacturer's Guide on Unistat ☐ Other Unistat Literature
- ☐ Feed Manufacturer's Guide on: ☐ Polystat® ☐ Histostat®
  ☐ 3-Nitro® Powder ☐ Nitrosal®
  ☐ Wormal and Wazine®
- ☐ Please have your field technical service adviser call on us
- ☐ Send information on Dr. Salsbury's Poultry Short Courses

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Charles City, Iowa

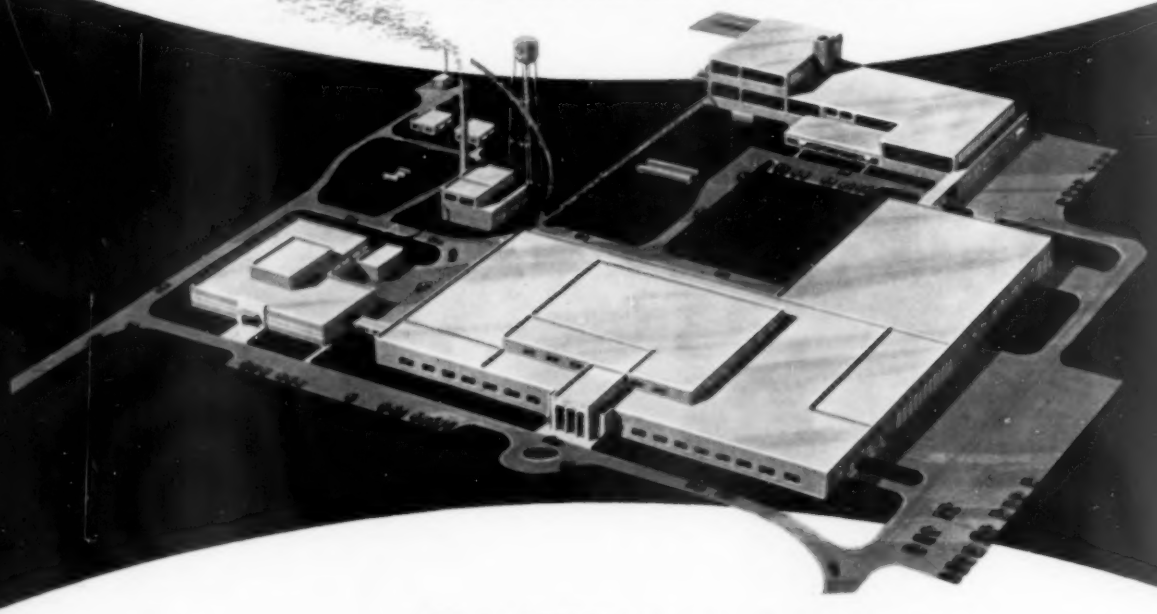
expanding...

TO MEET THE NEEDS OF GROWING INDUSTRY

Both the feed and poultry industries have grown tremendously in recent years. And that growth will undoubtedly continue, as the two industries strive to meet the needs of an ever-increasing population.

We, too, here at Dr. Salsbury's Laboratories, have grown considerably in the near past. Our family of feed additives is getting bigger. Unistat, the newest member, has caused us temporary growing pains. But we don't mind. Growth is a sign of life—and of good health. Unprecedented demands for Unistat—and our 40 other poultry and swine health products—forced us to expand, to build new facilities. We are, in a sense, expanding . . . to meet the needs of growing industry.

Shown below are Dr. Salsbury's production center buildings. Those parts shaded in yellow are now under construction, with completion scheduled for 1959; all others have been built in the last 12 years.



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NATIONWIDE SERVICE TO THE FEED INDUSTRY

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FIELD DAY

(Continued from page 70)

steers on grass will have to be correlated with winter feed treatments before the value of adding vitamin A and phosphorus in the winter ration can be determined.

In a progress report on an experiment to determine the value of stilbestrol implants in yearling cattle grazed on native range, it was said that the tests indicated that yearling cattle could be expected to gain 7-16% more during the summer with a 12 or 24 mg. stilbestrol implant, with some cattle gaining up to 30% more. The researchers—Dr. Thomas, R. W. Miller, Don Gill and Harley Jordan—said in their report that in general, Montana tests have shown that a 12 mg. implant will give about as great a response as a 24 mg. implant. They said that there should be no side effects from cattle implanted with 12 mg., and that this level should not affect subsequent gains made by steers in the feedlot.

Dr. Thomas and his co-workers reported that the levels of stilbestrol showing the greatest response in terms of weight gains were winter-summer combinations of 6-12 and 0-12 mg., and that one test with smaller numbers of cattle showed that a combination of 12-24 mg. gave the greatest gains.

Grub Control

Prof. Donald K. Scharff, department of zoology and entomology, emphasized that the new drugs on the market for cattle grub control must be used strictly according to the manufacturers' directions.

Prof. Scharff said that in his experimental work with Trolene (Dow ET-57) boluses, he got as high as 99% of the grubs in a herd, and that the kills he observed in herds treated with Trolene boluses last year by the ranchers themselves averaged about 90%. "When Co-Ral spray was used, the results I observed, and those reported by other workers, suggested that kills with this chemical have averaged considerably lower," he said.

He predicted that any cattle deaths this coming grub season due to the use of Trolene will be caused by (1) throat injury from the balling gun being used too roughly, (2) treating animals that are sick and (3) treating animals that on the verge of coming down with shipping fever, though not visibly sick at the time of treatment. He said that Co-Ral will kill young calves if directions are not strictly followed.

Other points expressed by Prof. Scharff were that Co-Ral and Trolene will, if used properly, result in considerable reductions in lice populations, and that in Montana cattle should be treated as soon as possible after the heel fly season, or generally from Sept. 1 through October.

"I feel that these two new insecticides are only the beginning in this field. If tests now underway are successful, you may expect, in a couple of years, much safer, easier-to-administer, and probably cheaper systemic cattle grub insecticides," Prof. Scharff concluded.

Winter Ration Additives

Another report by Dr. Thomas dealt with the value of feeding Dynafac, stilbestrol and Terramycin in various combinations in wintering rations.

He said the addition of any of the feed additives to the ration increased daily gains. "The control steers gained 1.31 lb. per day and steers fed Dynafac or stilbestrol gained 1.53 lb. for a 16% increase. Steers fed a combination of the two gained 1.75 lb. a day for a 34% increase over controls," Dr. Thomas reported.

"Terramycin-fed steers gained 1.58 lb. per day for a 21% increase. Terramycin plus Dynafac or stilbestrol increased gains by 28 and 26%, respectively. Steers fed Dynafac, stilbestrol, and Terramycin in combination gained 1.74 lb. per day for an increased gain of 32%."

He explained that all steers in the test were fed the same level of feed, and that therefore those lots of steers making the greatest gain required less feed per hundred pounds of gain. "The control steers required a total of 1206 lb. of feed per 100 lb. of gain; this level decreased to 903 lb. for steers fed the ration containing Dynafac and stilbestrol in combination," he said.

Dr. Thomas and R. W. Miller presented a progress report on stilbestrol implants for heifers grazed in irrigated pasture. They pointed out that in one of the series of trials heifers implanted with 6 or 12 mg. of stilbestrol gained 10-15 lb. more during the winter and when implanted with 12 mg. in the spring, ended up with about a 30-lb. gain over the controls. In another of the tests there was only a slight difference in gain made by any of the heifers, gains made by heifers implanted with 6 mg. were slightly below controls and those implanted with 12 mg. were slightly above gains made by the controls. "There were no apparent side effects from the implants. Higher levels of implants of both stilbestrol and Synovex need to be studied, particularly on different types of pasture," the researchers said. "There appears to be more variation in heifer response to stilbestrol implants than steers. Stilbestrol is not recommended for heifers kept for breeding purposes."

CELEBRATE ANNIVERSARY

DENVER—Mr. and Mrs. O. M. Kellogg, Denver, celebrated their 50th wedding anniversary recently. Mr. Kellogg founded the Kellogg Grain Co., 61 years ago. He is a past president of the Denver Grain Exchange, the Denver Feed & Grain Exchange and the Omaha Grain Exchange. He is still active in the firm he founded.

Most Ohio Beans Placed Under Loan

EDISON, OHIO — About 80% of the soybeans being received at the Morrow Supply Co. are being placed under government loan, Roy Schnell, manager, reports.

As a result of a bumper crop, receipts have been heavy and beans have been stored temporarily on the ground. Regular storage space has been filled with two-year-old corn. Mr. Schnell said that ground storage has been necessary because of heavy loan participation. Beans purchased outright could be shipped right out, but those going into loan are to be moved into new storage being built.

The loan price locally was reported recently about 26¢ bu. above the market, less deduction of 11¢ for prepaid storage costs.

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CELEBRATION, September 29 thru November 29

Our Anniversary celebration ties in with your Fall Selling Season. Omalass and Scotch O Lass really move through the fall feeding season, and during this time we are offering a terrific premium program to thank you for your cooperation and business.

Just a little push on either Omalass or Scotch O Lass and your sales will really climb. The finest dried molasses products on the market—easy to mix—perfect for bagged or bulk feeds—ideal for top dressing.

It pays to sell Omalass and Scotch O Lass—and during our Anniversary Celebration you get PREMIUMS TOO!

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Linear Programming—Part 7

Future Prospects for Use of Programming In Solving Feed Milling Problems

What are some of the possible future effects of linear programming and related changes on the feed industry? Whatever materializes, it is clear that this technique, and the rational approach to management problems which it symbolizes, will have an impact on the feed business

By Dr. Robert F. Hutton
Pennsylvania State University
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Dr. Robert F. Hutton

EDITOR'S NOTE: This is the seventh and last of a series of articles on the application of linear programming in the feed industry. In previous articles, the author has dealt mostly with the use of linear programming and electronic computers in feed formulation. In this article, he provides a look at possible future developments—including an automatic, computer-controlled feed manufacturing operation. Other possible uses of linear programming also are outlined. Whether or not all the "predictions" materialize, Dr. Hutton says, the point is that linear programming will have an impact on the feed business. And it is important that feed people in management, nutrition, production and other positions be familiar with it. Dr. Hutton, an agricultural economist at Pennsylvania State University, has been a leader in research on the application of linear programming in feed formulation and other problems.

In the previous six articles on application of linear programming to mill operating problems we have, on the whole, stuck fairly close to the runway. In this last article in this series we are going to leave the ground far below. We intend to give our imagination full reign in visualizing the possible future effect of linear programming and related changes upon the feed milling industry.

The Computer-Controlled Mill: Today we have a high degree of mechanical control over our mixing plants. The pride of the present age is the mix line that is controlled from a punch card reader in a central control room. The control card contains instructions that set the feeding gates or weighing hoppers to yield, without the chance of human error, the feed mix formulated in advance. But, someone had to make out the control card! Now, in making out this card this someone may have used linear programming. (If he did not, he probably will be doing so soon.) This seems clearly to be slack in the management linkage. Why not have the computer that solved the linear programming problem emit the impulses needed to set and control the gates and meters of the mixing line? If the model of the mix being run were developed and read into the computer, the only further human effort required would be that of giving the computer information on ingredient price and supply.

For companies using closed formula feeds, changes could be made "on the run." We can visualize the computer being fed continuously with price information (perhaps by wire from the exchange floor for some materials) and supply information (perhaps automatically from normal stock accounting records) and continuously adjusting the mix to maintain least-cost.

For the open-formula companies, things may be somewhat more complicated. Perhaps the computer could be made to control a tag printing operation; thus, keeping the tags in line with the current mix.

An intriguing possibility is that the feed inspection authorities can be fed information from the computer as to feed mix composition. The authorities could check the computer upon occasion for "truthfulness."

Automatic Analysis of Ingredients: The trouble mills occasionally experience in using average feedstuffs composition values could be avoided and product uniformity improved with the development of an automatic system for feedstuff analysis. The results of the analysis would be sensed automatically (without human intervention) and relayed to the computer controlling the mill. The feed-in of analytical values would be synchronized with flow of the material through the mill so that the mix would be formulated upon the basis of appropriate analytical values.

Formulating All Mixes in One Model: In our earlier presentation on least-cost formulation, we considered only one mix at a time. True, we did indicate that substantial parts of one feed mix model could be used in another. For example, most of the model for a 16% dairy feed could be used for an 18% dairy feed. This procedure is not ideal whenever it is necessary to ration some particular ingredient or ingredients because of supply limitations. In such cases it is necessary for someone to allocate these ingredients to the various mixes upon subjective judgment evaluation. You may obtain some guidance from the solutions, but room for error remains. (Each solution will indicate how much you could afford to pay for more of each ingredient that is subject to supply restriction.)

Ideally, we would build a general model embracing all feeds. Then we would give the computer supplies, prices, and amounts of each feed we wanted run. Solution of the model will give us optimum allocation of the ingredients subject to limited supply. This problem would tax the capacity of even the largest commercial electronic computers available today. But, when we consider that commercial electronic computers are a development of the last 15 years, we can reasonably expect both larger and relatively less expensive machines in the future.

Determining Optimum Mix Specifications: Aside from encouraging you to be open-minded with regard to mix specifications—particularly with regard to ingredient limits—we have not criticized mix specifications. We have taken those as given in the problem. Specifications should not be accepted as given, however, if maximum efficiency is to be achieved. In the future we may be determining the specifications and the least-cost mix simultaneously.

Broiler feeds can best be used as an illustration of the point we are attempting to make, but the principle applies to other feeds as well. It is well established that the efficiency of gain in broilers is a function of the energy level of the feed. The higher the level of energy, the more efficient the gain when efficiency is measured in terms of pounds of feed per pound of gain. However, feed cost is also a function of energy level. The higher the energy (generally), the greater the cost. Thus, it follows that for each different set of ingredient prices there is a corresponding optimum level of energy for the feed mix. Optimum, in this sense, is that level that will produce a pound of gain at the lowest cost.

Research upon the variation of rate of growth with change in other feed characteristics is not so far along as that on energy. There seems little reason to suppose that these specifications cannot be varied also, but the research results are not yet available, at least to me. Moreover, we are much better off with respect to our knowledge of poultry nutrition than we are on other animals (including humans). So we will have to await the development of knowledge in this area, but seeing its importance may stimulate our work on these problems.

Of course, feed is only one of the inputs in the farming business. If we change the specifications of the feed, this may require change in the amount of heat, labor, building space and so on. Using the broiler feed as an example again, if we lower energy we will lengthen the period needed to get the chicks to a marketable weight. More labor and more building space will be required. The optimum feed mix should take these variables into account also. We now have the analytical tools to effectively employ data on these variables. Unfortunately we do not have the data.

Prescription Mixing: There are instances of basic economic conflicts between the large feed mill and the very small mill. The large mill has advantages in purchasing and in in-plant efficiencies. The small mill is in a position to give personalized service to its customers. Of course, the limiting case of the small mill is the farmer who mills his own feeds.

It seems to me that the conflict is likely to increase in the future. Undoubtedly, the technological advances are going to favor the large mill relative to the small. On the other hand, as farmers apply more knowledge and information to feeding of their livestock, there will be increased potential demand for more personalized mixing services.

Let us take the problem of feeding dairy cattle for instance. Several states, including Pennsylvania, are planning or have under way a forage testing program. When such a program becomes of general use, which seems to be a matter of a relatively short time, farmers will know more precisely what they are feeding in the way of forage. The old crude approximations based upon specie, color, leafiness (and even the more recently developed crude approximation based upon date of cutting) will give way to a more objective measure of feeding value. As long as the farmer had only the vaguest notion of his forage analysis, he was content to accept rough rules-of-thumb concerning the level and composition of the grain component of the ration. If he was not content, at least there was little he could do about it. Prudent husbandry dictated that he cover risk of nutritional deficiency by a wide and costly safety margin in the grain mix specifications. Moreover, in the presence of a wide area of ignorance, there was little point in being precise in the grain mix specifications. He generally was willing to accept one of the "standard model" feed mixes provided by the feed milling industry.

This attitude should change with the coming of forage analysis. We expect the farmer to look upon the feeding problem as one of meeting the "specification" set by the need of the animals he is feeding. His home produced forages (and other feeds) will be one set of ingredients that can be used to meet these specifications. He will desire of his grain supplement the least-cost means of satisfying the residual specifications.

Anyone at all familiar with the variability between farms in kind, amount and quality of feeds produced and in quality of livestock fed will realize that "standard model" feed mixes stand little chance of ideally suiting many feeding situations. The economic loss involved in using a "standard model" instead of a "cus-

REPRINTS OF LINEAR PROGRAMMING ARTICLES AVAILABLE

The series of seven Feedstuffs articles on linear programming by Dr. Robert F. Hutton are being reprinted in booklet form. Many nutritionists, management personnel and other feed men are expected to find the complete series valuable as the use of linear programming and electronic computers increases. A number of companies already have computers or use commercial computing services. The booklet will be available at a price of $1 per copy. Orders may be sent to the Reader Service Department, Feedstuffs, P.O. Box 67, Minneapolis 40, Minn. Payment should accompany the orders.

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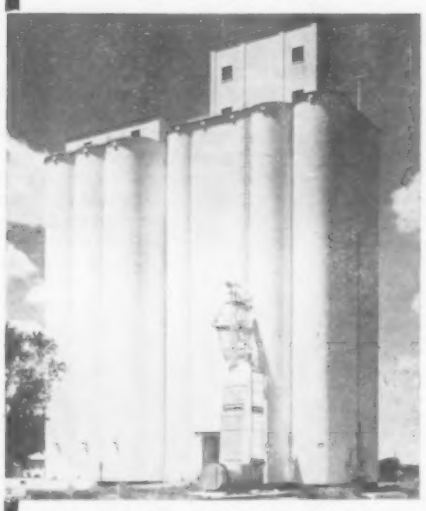

MATT A. CRAWFORD is owner and operator of this fine, modern plant. Unit on right was built in 1955 . . . unit on left was added in 1958. Farmers like the 70-foot truck weighing scale featured at Crawford's elevator—the only such unit in the entire grain area.

HAMAR CO-OP ELEVATOR, HAMAR, N.D.

THE HAMAR CO-OP ELEVATOR shown above is cribbed construction and was quality built by Hogenson. Whatever your needs, frame or fireproof construction, let us talk it over with you.

FARMERS' ELEVATOR SERVICE CO.
FORT DODGE, IOWA

THIS ALL-CONCRETE, push-button feed mill and warehouse are managed by Morel Stientjes. The mill features individual scales for each ingredient, conveying equipment direct from packers to truck loading dock or warehouse storage. Bulk carload or truck unloading and bulk finished product loading facilities are featured.

H O G E N S O N

Here's a Photographic Report on Some of Hogenson's Quality-Built Jobs . . .

SAUDER FEED MILL, TREMONT, ILLINOIS

WILLIS SAUDER is owner and operator of this modern custom and commercial feed manufacturing plant. With a capacity of 75 to 100 tons a day, the firm serves a 100-mile radius territory around Tremont. Features include automatic batching system, complete molasses pelleting and crumbling facilities. The Sauder plant is one of the finest in the territory.

AMES RELIABLE PRODUCTS CO.

This Ames Reliable plant features all-concrete construction, push-button control. Charley Barr, president (inset), points out that the plant will turn out as much feed in two hours as could be produced in 12 hours 25 years ago.

BEFORE YOU MAKE PLANS . . .

. . . for building a new mill or elevator—or for remodeling your present plant—it will pay you to talk to HOGENSON. Our specialists will work with you closely from drawing board to completed project. Let us give you a HOGENSON "QUALITY-BUILT" estimate on your job. . . you'll always be glad you did!

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Hogenson
CONSTRUCTION CO.

722 FLOUR EXCHANGE • MINNEAPOLIS 15, MINN.

Richard L. Kanakis | George R. Russell | Norman A. Kocher

THREE PROMOTIONS—A. E. Staley Manufacturing Co., Decatur, Ill., has announced the promotion of three men in the formula feed sales department. They are: Richard L. Kanakis, to supervisor of special accounts after serving as staff assistant; George R. Russell, to staff assistant succeeding Mr. Kanakis after being a sales coordinator, and Norman A. Kocher, to sales coordinator succeeding Mr. Russell after working in the purchasing department.

tom model" may not be dramatically large. But, as farm units grow larger and the margin in feeding shrinks, this difference will become increasingly important.

Another contributing factor to the development of demand for prescription milling will be the improvement in our knowledge of nutrition. Theoretically, we would expect there to be a different optimum set of feed specifications for each set of relative feed ingredient costs and animal product prices. (Bringing product prices into the picture may seem strange to you, but I am sure you will agree that heavier grain feeding of dairy cows is justified at $8.00 than at $2.50 for milk.) Putting this theoretical possibility to work requires knowledge of the relationship of output of animal product to a wide range in ration specifications. Most work, so far, has been either with fixed level specifications, as feeding rate was varied, or with complex changes in specifications from ration to ration, with or without variation in feeding rate. From this kind of work it is impossible to get the data needed. Fortunately work has now begun which will yield some of the needed information. Much more work remains to be done.

Linear programming may be used by (or for) the farmer in choosing the optimum total ration. We have plans to make such a formulation service available to farmers in conjunction with the forage testing program. Such a program could also be easily developed, even for individual cows, for farmers cooperating in the DHIA program. In the future, feed mills may wish to participate more fully than at present in such total ration planning programs. (Some mills are now providing services of this sort but generally only upon rather superficial examination of the forages and livestock producing ability. There appears to be some evidence that some millers are more interested in promoting heavy sale of their particular brand of feed than in giving the farmer the maximum profit ration. This is probably to be expected and the farmer's profit may be improved over his previous practices; but, in the long-run, the mills following this practice may be forced to more nearly the position of the feeder's best interest.)

At present it would be extremely costly for a large mill to attempt to formulate a feed to the individual farmer's specification. When (and if) we get the truly automatically controlled mill we visualized earlier, this will no longer be true. The order taker will simply prepare a control card (or other input carrier) giving the specifications, amount and consignee of the order. Orders received by the mill within a given operation period (a day or a week) will be automatically analyzed to give optimum loading, routing and sequence of milling. The feed will be milled, and the order billed without further human intercession. There would be only momentary separation breaks in the flow through the mill between orders.

Milling Complete Rations: So long as agriculture keeps its present structure there is not likely to be a general market for complete rations outside of poultry where the complete ration is now the rule. However, not many informed observers believe the structure of agriculture is going to remain the same. I am personally impressed by the difficult capitalization problems that will face farmers if they expand to the scale permitted by present or prospective technologies. Financing out of personal equity a business of a quarter to a half million dollars is not a simple matter as you probably are aware. The gains from adopting the new technologies are apt to offer very strong motives for expansion in size. I visualize this pressure for change will force agriculture to "come apart at the joints." That is, the stages of production will be separated into specialized businesses, each of which can apply fully the improved technology relating to its stage. As a consequence of this separation, for example, one group of farmers would produce the crops and another would keep the animals, much as is the pattern in certain parts of the West Coast area today.

This change could be very important to millers. The specialized animal farmers will want to simplify their feeding operations as much as possible. The ultimate, it seems to me, would be a complete ration that can be self-fed free choice. The dairyman and other large animal feeders would then be able to achieve the labor efficiencies in the feeding chores being realized by poultrymen. These rations could be planned for least-cost both with respect to ingredient composition and specification by use of linear programming techniques.

This change probably could be realized without great increase in ration cost. The forages would be considered by millers along with grains and

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by-products in formulating the mixes that would be of considerably different specifications than our present feed mixtures. If the forages are going to be transported from specialized producers to the animal feeders anyway, the fact that they pass through a feed mill enroute is going to be of small cost consequence. These added costs can probably be recovered in greater feed efficiency resulting from more accurate control over intake and from the improved materials handling properties given to the ration by the milling processes. This development could lead to the further expansion of "integration" of the feed industry with the farming industry.

Planning for Optimum Line of Products: Before the industry goes over completely to custom mixing (perhaps a matter of a few generations) there will remain the problem of the optimum line of feeds to produce. To some extent this is not wholly a matter of choice on the part of mill management. In order to sell the feed you want to make, you have to make and sell some you would just as soon not make. In technical jargon the different lines of feed are in "joint demand." But, you still have some freedom and over time you are in a position to gain considerably more freedom, so the choice of the line of feeds to mill is a realistic problem.

This constitutes an excellent linear programming problem provided the required data are available. You would need to know: (1) the quantity of each kind of feed that buyers would take at all relevant prices, (2) the output of your plant at each possible combination of kinds of feed, and (3) variation in current inputs related to each combination. You could then fit these things together so as to determine how much of each kind of feed to mill in order to maximize net revenue. I will not even guess at how likely you are to obtain the data needed. Perhaps you would not be any worse off than at present if you had to operate on estimates (logically you are doing that now in a very loose analytical framework). But, I will hazard the guess that your accountants will be taking a less mechanical view toward allocation of overhead and estimation of cost than is generally the case at present. Already the logic of the method implicit in programming is being felt in the accounting profession.

Conclusions: I am not at all sure that any one of my "predictions" will stand the test of time. I am not really concerned that they do. Linear programming and the rational approach to management problems it symbolizes together with the changes that are accruing in our economy are going to have an impact upon your business. If what I have said here makes this point, I am satisfied. You will be in a better position to foretell the future consequences of these changes upon your business than anyone else.

North Dakota Building Animal Nutrition Unit

FARGO, N.D.—The North Dakota livestock industry is expected to receive a boost with the completion next summer of the new animal nutrition center of the North Dakota Agricultural Experiment Station, Fargo.

The center consists of a main T-shaped laboratory building with three wings attached. The wings are a hog barn, a sheep barn and a hay storage building. Two separate cattle units form another section, located near the main building.

The laboratory section will include a complete feed processing plant, with equipment for pelleting, chopping, crushing, rolling, grinding and mixing. Also in this central section are an office for record keeping, a room for the small animals, two laboratories for work with individual animals in such studies as amino acid trials, an operating room in which veterinarians can work with the experimental animals and a chemists' laboratory.

When the buildings and pens are completed, they will house 168 cattle, six to a pen, each year. There will be 14 lots for lambs and 34 lots for pigs, making possible experimental use of 300 to 350 lambs and approximately 600 pigs each year.

Iowa Compares Sugar, Saccharin for Pigs

AMES, IOWA—Substantial savings in costs for hog producers can be achieved with the use of saccharin and whey in place of sugar in prestarter and starter rations for pigs, according to the October issue of Iowa Farm Science, publication of the Iowa Agricultural Experiment Station.

The publication quotes Dr. Damon Catron and co-workers as stating that 1 lb. of saccharin per ton of feed makes the feed as palatable as 300 lb. of sugar if the sugar is replaced by an equal amount of sweet dried whey.

"Preference tests show that baby pigs choose saccharin diets over diets containing no sweetener, and the use of saccharin also eliminates the pelleting problem usually associated with rations high in sugar," report the researchers.

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BOARD OF DIRECTORS—Members of the board of directors of the Los Angeles Grain Exchange are, left to right, seated: John Follmer, Follmer Grain Co., vice president; A. W. Blasingham, the Pillsbury Co., president, shown in the inset as he spoke during dedication ceremonies for the exchange's new quarters, and L. D. Elfelt, Jr., Cargill, Inc., treasurer. Standing: Gabriel Bass, secretary; Paul H. Bimmerman, Quaker Oats Co.; J. W. Flammer, Flammer Grain Co.; Thomas H. Jones, Poultrymen's Coop. Assn., and F. E. Boss, Ralston Purina Co.

Los Angeles Exchange in New Quarters

The Los Angeles Grain Exchange, which has been located on the fifth floor of the Farmers & Merchants Bank Bldg., 124 W. 4th St., since its incorporation in July, 1913, has moved to the new Grain Exchange Bldg. at 972 S. Goodrich Blvd. in east Los Angeles.

The grain exchange quarters, consisting of a spacious call room, grain inspection facilities, reception room, secretary's office and general office, and the offices of several member firms who were formerly located in the Farmers & Merchants Bank Bldg. occupy the second floor. The building is modern in every respect and completely air-conditioned.

The new location is convenient to downtown Los Angeles, only 15 minutes by the Santa Ana Freeway. For the accommodation of out-of-town visitors who may not be driving, the exchange and member firms will provide transportation from the downtown area, which can be arranged by calling the secretary.

The dedication ceremony for the new quarters held recently was attended by more than 150 members and guests representing most of the grain, feed and allied industries of California. Also present were representatives of railroads, banks and commodity brokerage firms. A trading session at 1 p.m. preceded the ceremonies, following which A. W. Blasingham, the Pillsbury Co., exchange president, told of the circumstances which instigated the move away from downtown Los Angeles. The exchange and member firms with offices in the building held open house for the balance of the afternoon, during which refreshments were served.

Rules, regulations, trading standards and codes of ethics established by the exchange promote the orderly merchandising of large quantities of grain consumed by the cattle and poultry industry in the Los Angeles area.

A daily trading session is held from 1 to 1:30 p.m. with bid and asked prices of the various grains recorded during this period being published in a bulletin which is distributed to members and subscribers. Spot and prompt (10-day shipment) prices are reported to the local newspapers.

ENTRANCE—Here is the entrance to the new Los Angeles Grain Exchange Bldg. from the west end.

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on industry developments comes to you weekly . . . while it's still news in
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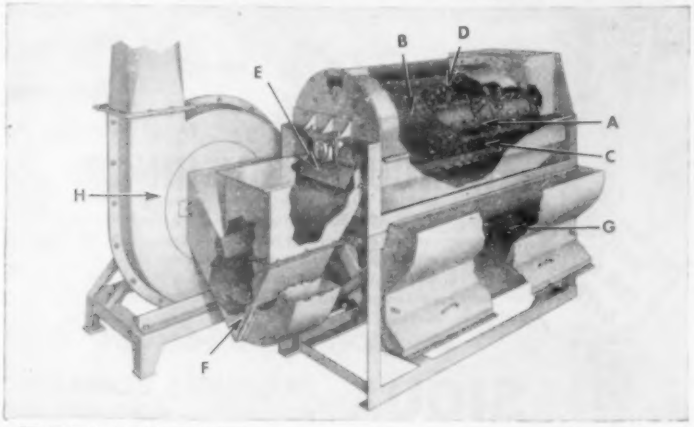

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The unique principles developed by TRIUMPH Engineers for the TRIUMPH No. 1200 Corn Sheller have produced superior performance and high shelling rates in the high moisture corn areas of the East, and the Southern Snapped Corn Areas of the South as well as the machined picked corn areas of the Corn Belt. That these principles have produced outstanding results is demonstrated by the wide acceptance and popularity of the TRIUMPH No. 1200 Corn Shelling System by commercial corn handling plants in the very areas where corn shelling problems were the most troublesome in the past.

Along with the development of better corn shellers, TRIUMPH Engineers and Distributors have helped solve many problems relating to handling and shelling ear corn from the dump pit to the cob bin.

The valuable experience of TRIUMPH in this specialized field is a plus value gained only in buying TRIUMPH.

Check these new patented principles of sheller design developed by TRIUMPH Engineers:

A—Rugged Shelling Cylinder—improved design—carefully engineered for maximum agitation assuring thorough shelling and separation. B—Every inch of area around the shelling cylinder is actively used to screen out shelled corn. C—Area between shelling cylinder and screen enlarged to provide high shelling rates and allow foreign material to pass. D—Curved Comb Bars control rate of flow internally to assure full separation. E—Automatic control of discharge rate. F—Pneumatic trap for foreign material. G—"Push-Pull" cleaning thoroughly controls aspiration of shelled corn. H—Separately powered, high capacity cob blower with flexible positioning engineered into the shelling system.

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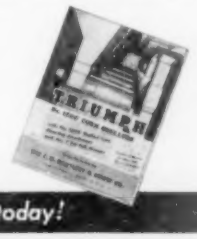

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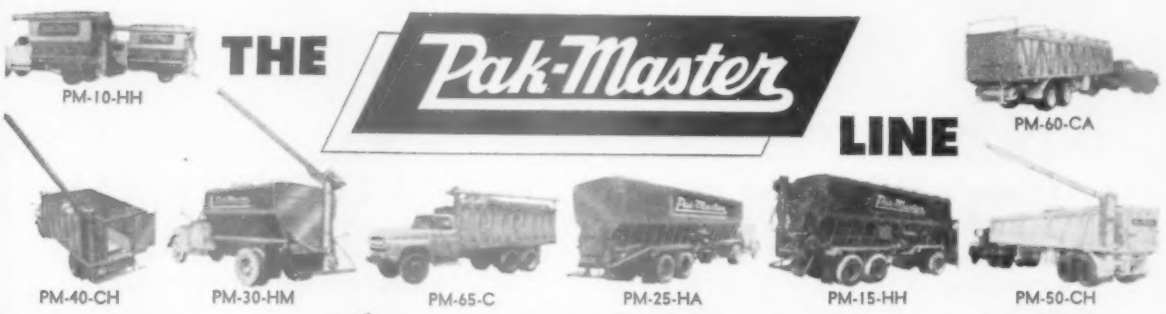

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Indiana Feed Tonnage Up Slightly in 1957, Report Indicates

LAFAYETTE, IND. — Commercial feed sold in Indiana during 1957 has been estimated at a total of 1,212,443 tons, according to a report released recently by the state chemist. This is a slight increase over the 1,184,575 tons reported for 1956.

Total tonnage of mixed feeds, however, was down slightly from the previous year, according to the report. Mixed feeds sold during the year totaled 960,611 tons, compared to 970,235 during the previous calendar year. The drop in mixed feeds came primarily in cattle, dairy and sheep feeds and in poultry feeds.

The poultry feed total (not including medicated poultry feed or scratch grains) was 327,963, compared with 371,263 in 1956. Cattle, dairy and sheep feeds dropped from 128,940 in 1956 to 122,712 tons in 1957. Medicated poultry feeds, however, showed an increase. (See Table 1.)

Among the ingredient feeds, alfalfa products, animal products, linseed oil meal and milk products showed the largest decreases. Ingredient feeds showing substantial increases were brewers and distillers products, corn products, oat products, soybean oil meal, wheat products and a miscellaneous group which includes beet pulp, peanut oil meal, citrus meal, bakery refuse, molasses and others.

TABLE 1. Estimated Sales of Commercial Feeds in Indiana

Kind of feed	—Estimated tons— 1956	1957
INGREDIENT FEEDS:		
Alfalfa products (meal and leaf meal)	24,210	18,520
Animal products (meat scraps, tankage, etc.)	36,298	30,717
Brewers, distillers products	2,918	12,699
Corn products (hominy feed, germ meal, gluten feed, etc.)	14,270	20,505
Cottonseed meal	7,398	7,102
Linseed oil meal	4,364	3,330
Marine products (fish meal, crab meal, etc.)	4,230	4,638
Milk products (dried and condensed buttermilk, skimmed milk, whey, etc.)	11,477	7,797
Oat products (oat shorts, oat hulls, oatmeal, etc.)	8,365	12,803
Soybean oil meal	84,959	71,506
Wheat and rye products (wheat bran, middlings, rye feeds, etc.)	35,132	47,461
Miscellaneous (beet pulp, peanut oil meal, citrus meal, bakery refuse, molasses, etc.)	10,719	14,754
MIXED FEEDS:		
Calf feeds	6,358	7,613
Cattle, dairy and sheep feeds	128,940	122,712
Horse and mule feeds	1,917	5,920
Poultry feeds (mash, pellets, etc.)	371,263	327,963
Poultry feeds medicated	123,181	137,917
Poultry scratch grains	5,218	9,833
Small animal and pet feeds (rabbit, dog, etc.)	22,683	26,655
Swine feeds	262,217	265,880
Chop (corn and oats and miscellaneous chops)	6,576	5,458
Medicated stock feeds	7,774	10,390
Mineral feeds	24,197	24,029
Unclassified	9,911	16,241
Total mixed feeds	970,235	960,611
Total (combined)*	1,184,575	1,212,443

*Does not include feeds registered under annual registration fee.

Pfizer Laboratories Appointment Made

NEW YORK—Appointment of Dr. Hilmer L. Jones as veterinary medical director of Pfizer Laboratories has been announced by the pharmaceutical division of Chas. Pfizer & Co., Inc., New York.

Dr. Jones joins the company's headquarters staff in Brooklyn. He will coordinate clinical investigation of new Pfizer veterinary products and will serve as technical consultant to veterinarians in private practice.

Formerly a research veterinarian at Pfizer's agricultural research and development center near Terre Haute, Ind., Dr. Jones holds B.S., M.S., and D.V.M. degrees from Alabama Polytechnic Institute, Auburn.

In his new position he will serve as liaison with Pfizer scientists at Terre Haute and will help guide veterinary products from research to marketed dosage form.

At Terre Haute, Dr. Jones worked in agricultural research and as a field veterinarian, testing the practical application of new research discoveries.

His appointment is one of a series of moves designed to enable Pfizer Laboratories to serve the veterinarian more effectively, the announcement said.

Southern States Begins Kentucky Bulk Delivery

RICHMOND, VA. — Southern States Cooperative, Richmond, began bulk feed deliveries in Kentucky recently, according to a report in Service Guide, a publication of the cooperative.

Feed deliveries are being made with an 18-ton air delivery truck hauling feed from the Cincinnati mill. The truck body is divided into six three-ton compartments. An auger, running the full length of the body at the bottom of the compartments, pulls the feed to the rear of the truck where it is then moved by air through a flexible steel hose, which is fastened to a fill pipe on the patron's feed bin.

Any way you look at it . . .

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That's because the Ultra-Life Program is a complete program built to help you make top quality feeds and sell them. Expert technical assistance in all phases of formulating, manufacturing and selling your own brand name feeds.

You get exclusive sales programs that really help you market your products, poultry and livestock schools to train your employees in on-the-farm service.

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MERCHANDISING

(Continued from page 59)

ness has helped most in the past two years. Most frequent mentions were:

A. Resale work with feed company salesmen—19%.
B. Feed company feed contracts—19%.
C. Selling a greater variety of non-feed items—16%.

From this we can conclude that there is apparently no one formula for success. Many of the dealers reporting failed to even attempt to pick out one particular thing that had been more valuable to them than other promotions in their business.

4. Trends in dealer expenditures for advertising. The general tendency the past two years is for dealers' expenditures for advertising to increase—both in total amount and as a percentage of sales.

Figures on total dollars spent for advertising in newspapers, direct mail and radio are up for about 40% of the dealers; about 10% of the dealers seem to be reducing; and approximately 50% of the dealers do not seem to be making much of a change as against two years ago. At present, about 1.2% of gross sales is invested in advertising. This percentage is up over two years ago for 33% of the dealers, down for about 10% of the dealers and the same for approximately 57% of the dealers.

After thoroughly analyzing other dealer organizations during the past three to five years, we have pretty well concluded that the average feed dealer could and perhaps should spend from 1.25 to 1.50% of his gross sales for advertising. This will naturally depend upon whether he has a large gross sales as a result of his grain operation, and sometimes it will depend upon the amount of other items such as hardware, etc., that might be included in the gross sales.

Now that we have fairly well reviewed the dealer who is most apt to grow and remain in business through this period of rapidly changing techniques of sales and service, let's move into the field of bulk feeds.

Bulk Handling

The matter of bulk handling equipment and the merchandising of bulk feeds is certainly a big field within itself. There are economic advantages to a dealer who is equipped to receive his feeds in bulk, and there are consequent economic advantages that the dealer can pass on to the feed customer who has a bulk feeding operation. Bulk handling at both the feeder and dealer levels offers production economies that permit more narrow operating margins without jeopardizing the operating profits.

Just what has brought about the rapid growth of bulk feeds? In my estimation the one greatest factor has been that of efficiency. The demanding need is for greater efficiency at the manufacturer's level, at the feed dealer's level and at the feeder's level. Another factor contributing to the expansion of bulk feed has been the greater use of complete feeds.

What some people call the "big bad wolf" of the agriculture industry today, commonly referred to as "integration," has certainly played its part in forcing bulk, thus giving greater efficiency in operation and feed cost savings to integrated projects. While bulk feeding operations are more dominant today in Michigan in the poultry industry, it most certainly is going to rapidly move into the areas of the dairy, hog and beef cattle producers.

Let's have a look at what the survey reveals with regard to the Michigan feed dealer and his current position on bulk.

1. Bulk feed features offered by dealers. Whereas two years ago only 8% of the Michigan feed retail dealers offered any bulk features for their customers, today these features are offered by 24% of the dealers—a three-fold increase. This increase makes it quite apparent that bulk business is growing both rapidly and steadily.

2. The bulk feed business in the local community. The average Michigan dealer reports that less than 10% of the local feed business is now handled in bulk. On the other hand, when asked to look ahead two years, the average dealer predicted that over 30% of the feed business in his community would be handled in bulk. In other words, these dealers believe that within the next two years a three-fold increase can be anticipated

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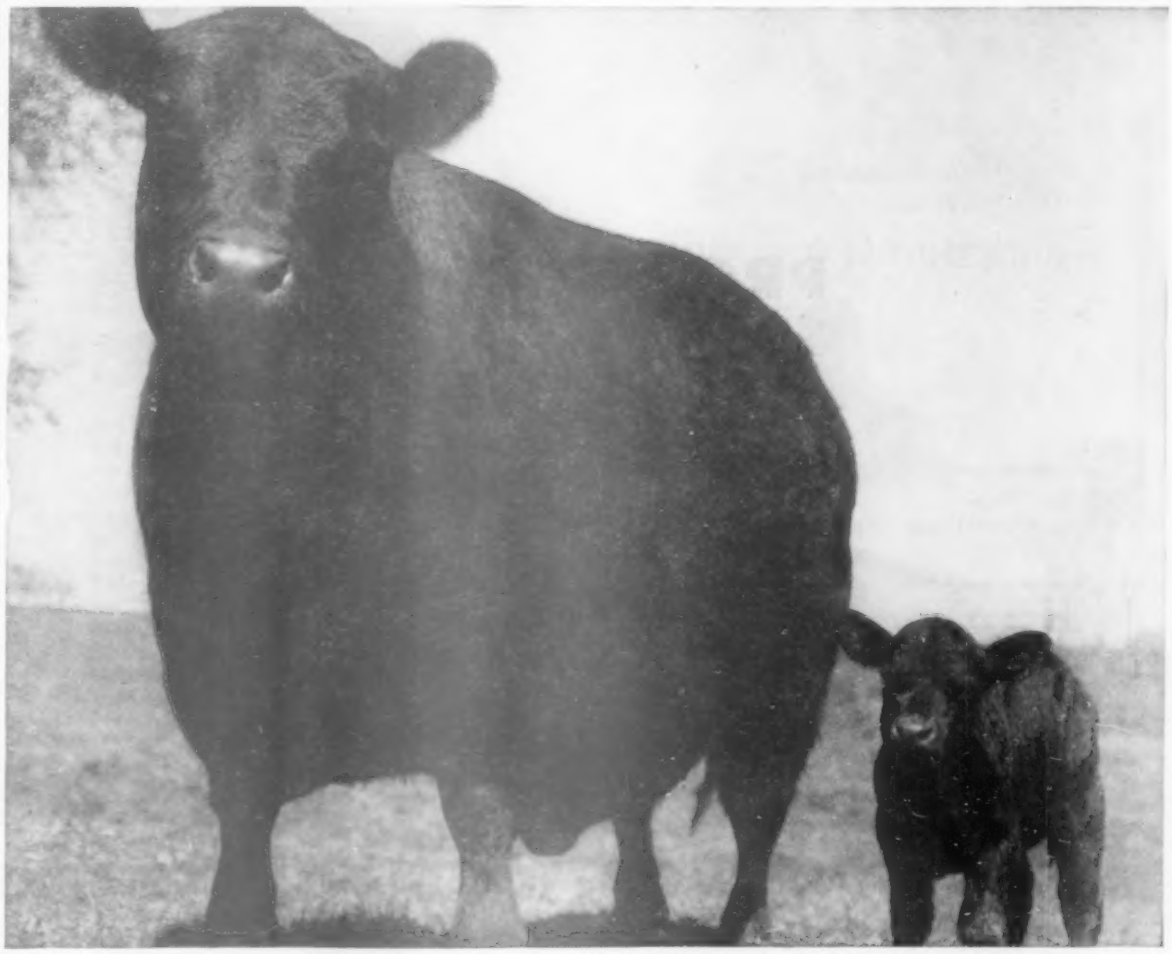

She "packs a paunch" for profits!

Today, as a million years ago, ruminant animals have a major advantage as producers of meat and milk for human food. In their "first stomach" or rumen, cattle, sheep and goats have billions of micro-organisms at work, tearing down fiber and digesting feedstuffs to provide the animals themselves with more feed value out of a high-roughage ration.

Modern science is developing many new aids for making this ruminant digestion even more efficient, to produce more meat and milk at low cost. One is the use of PROCADIAN® Urea as a quick and economical source of protein. Another is the use of larger amounts of coarse roughage, which is digested faster and more completely by the rumen micro-organisms getting the PROCADIAN Urea source of protein in a balanced concentrate.

The high concentration of PROCADIAN Urea as a source of protein leaves room in the feed formula for all the energy, minerals, vitamins and other nutrients needed to make digestion and milk or meat production more efficient.

PROCADIAN Urea is a pure, free-flowing product that is ideal for feed formulation. It is supported by a powerful, educational advertising campaign that tells your customers to "look for urea on the tag" in buying feed. It pays to let your customers know that you are using PROCADIAN Urea in your feeds.

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The quick source of protein in mixed feeds

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in Michigan in bulk feeding from the dealer to the feeder level.

3. Do Michigan dealers anticipate installing bulk feed facilities? Within the next 12 months better than one fourth (26%) of the dealers who do not at present have bulk feed facilities of any kind, plan to make at least some type of bulk feed installation.

This is why I say again that I do not feel that bulk feed is still just a trend. If these dealers carry out their intentions to install some bulk feed facilities, the number of dealers so equipped in Michigan will almost double (will go up 83%), and this, of course, does not include possible expansion of bulk feed features offered by dealers who now have some bulk feed facilities.

4. Grain bank. Only three out of 10 Michigan feed dealers today offer grain bank services. A great majority (95%) of these dealers who do not offer grain banking now say they have no intention of doing so. In fact, if those few dealers who intend to offer grain banking were combined with those presently offering it, we would still have only about one third (34%) of the Michigan feed dealers offering grain bank services.

We could conclude from this that the decision on whether or not to offer grain bank services seems to have been taken already by most dealers. However, it is my opinion that as the dealers in grain surplus areas add or expand their bulk facilities, they are going to find it advisable to start including the grain bank program in their services. It has already proven itself as a very valuable service by most every dealer who has included it in his merchandising program.

Another question asked in the survey was whether the integration movement was having any influence on the feed dealers' business at present. Apparently, it has not had a very strong effect as yet upon the Michigan feed business. In response to a free-answer question on this subject, only about one out of seven dealers gave any indication that the integration movement was affecting him in any way.

Bulk Advantages

Now, let's have a look at some of the basic reasons for considering bulk feed in your operation:

1. Bulk feed is labor saving. It can be labor saving from the standpoint of being unloaded from the rail car or bulk truck and in the mill proper. Bulk feed is also more considerate of the human element in that it eliminates the need for the millman to be lifting so many heavy sacks of feed throughout the day. By properly planning bulk bin installation in conjunction with grinder and mixer equipment, both time and labor can be saved at the dealer level.

2. Bulk can increase grinding capacity. This is brought about, of course, by the labor saving, which eliminates hand loading of the feed from storage to the mixer, and the untying and handling of each bag again at the mixer. Thus, using bulk concentrates permits more steady usage of grinding and mixing equipment.

3. Attracts larger feeders. Bulk service at the dealer level and offering bulk servicing of the feeders will attract the larger and specialized feeder in your area.

4. Bulk feeds are a new kind of competition. Unquestionably the progressive bulk feed dealer will eventually eliminate the small bag dealer. Remember what we had to say about the primary function of the feed dealer earlier? It was pointed out that the primary function of a dealer today is to render service to his customers. I firmly believe that bulk feed handling can and will become one of the most important services to customers.

5. Actual dollar savings. From the manufacturer to the dealer, bulk feeds will actually carry a discount of from $4 to $6 ton under sacked feed price. This is due in part to the added cost of the sacking material itself and, in part, to other costs of filling, sewing, handling and warehousing sacked feed. However, when a dealer is considering his savings in bulk feeds, he must not only consider the discount that he receives from the manufacturer, but he must definitely consider the dollar savings in labor at his own mill. Too often a dealer forgets this savings when considering bulk feeds for his operation.

Advantages for Feeder

Now let's look at some of the advantages of bulk feed for the livestock and poultry producer—your customers who, after all, are your ultimate bosses:

1. Savings in labor. Many hours can be consumed in loading and unloading individual sacks of feed. There can be a definite savings in labor in getting the feed from the storage into the feeder equipment. Quite often on the feeder level special costly bin construction or the purchasing of special bins is not needed. Many feeders are able to convert old grain bins at a nominal cost. Some will use wagon boxes or trailers. Small commercial bulk bins can be purchased by a feeder at a very nominal cost.

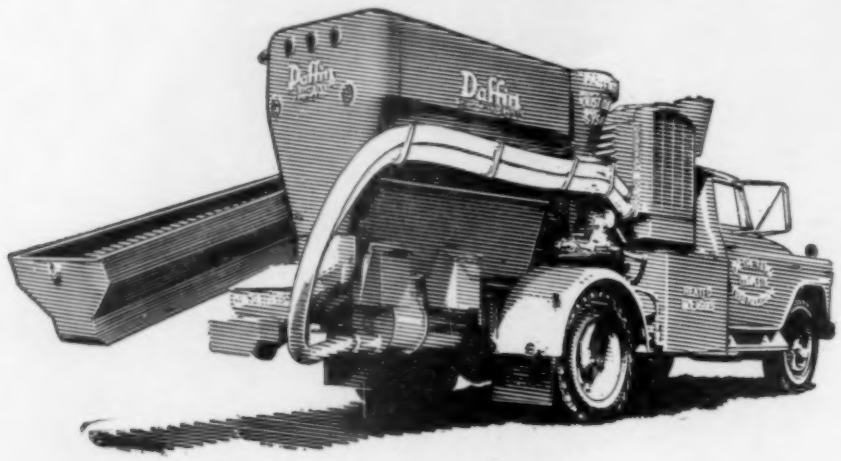
2. Dollar per ton savings. This saving is brought about as a result of the same factors involved in the dollar per ton savings made by the dealer in purchasing and handling bulk feeds from the feed manufacturer. Dollar savings to the feeder would naturally vary, depending upon the savings that the dealer feels that he can economically pass on.

3. Reduction in mice and rat damage. This damage can be costly to the feeder when purchasing in bags because of the loss of returning bags, and it can also be a big expense because of the loss of feed.

4. Fewer disease hazards. In addition to the danger of disease germs in reused bags, there is another often overlooked possibility of contamination by the hauler, who can, in unloading feed into poultry houses or other feed rooms, scuff off contaminated material clinging to his shoes picked up from the feed room on another farm. None of this can happen with mechanical unloading into the storage area from an outside point.

5. Increase in number of units one feeder can handle. Because of labor saving in his feeding operation, a

PROFIT EXTRAS*



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Dale O. Streitenberger

SALES MANAGER—Dale O. Streitenberger has been appointed sales manager of the Tuxedo Feeds division of the Early & Daniel Co., Cincinnati. The announcement was made by Robert E. Early, Sr., president, who said the appointment is part of the company's over-all expansion program. Mr. Streitenberger joined the firm in 1950 as sales representative for the southeastern Indiana territory. He has a background of more than 13 years in merchandising and sales promotion, and "contributed greatly to the company's dealer-level promotions," the announcement

feeder can very well expand his operation without increasing labor costs.

Now let's have a look at the other side of this bulk feed business and study the disadvantages.

1. Change in pattern of operation. All of us dislike change. Change is painful. We can readily see the importance of change so far as the other person is concerned, but when it gets down to us, as individuals, having to accept change, too often we are reluctant to accept the change. The change in the pattern of operation of a feed mill is not particularly an erratic change, but many of us can find a dozen and one reasons, or perhaps I should say excuses, for not wanting to make a change. It is, however, a problem and we recognize it as being considered one of the disadvantages of bulk.

2. Investment. The investment in bulk feed equipment at the dealer level can vary a great deal just as it can in the case of the feeder.

3. Shrinkage. The problem of shrinkage may be increased by faulty equipment and installation and careless operation. Our experience is that it need not exceed 1%.

For the past few years, the number of livestock and poultry producers has been steadily decreasing. Our farmers of today have larger operations, they have become more efficient producers, and they demand more and better services than ever before. Each year, the producer uses more livestock and poultry feed than the year before. Each year he becomes more important to the feed dealer and to the people for whom he produces food and fibre.

We in the feed industry have a terrific responsibility to this "boss" of ours. We can expect him to do his business with the feed dealer who aggressively solicits his business and renders him the service that he so deserves.

FEED FIRM OPENS

HARTLEY, IOWA—The J. J. Feed Service operated here by Jerry VerHoef and John Elgersma is now open for business. Leo Mousel will be in charge of the store while the owners operate their mobile feed mill. The firm will handle Ful-O-Pep Feeds.

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70% WEST COAST **HERRING MEAL**

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Here's what we are telling your customers about

THE IMPORTANCE OF VITAMIN D FORTIFICATION

Scientifically balanced formulations now assure that feeders get all the known elements for animal nutrition in the feeds they buy.

Vitamin D fortification is especially important with today's practice of raising animals in confinement. Recently, even hogs are being raised in air-conditioned piggeries. This abbreviates the exposure of growing animals to the sun's rays, an important source of vitamin D_2.

Since roughages are a variable source of this essential vitamin, a new significance is put on heavy vitamin D fortification of feeds with Fleischmann's FIDY Irradiated Dry Yeast.

Prevention of Milk Fever

FIDY, a rich source of vitamin D_2, is also used in the prevention of Milk Fever. Fed in massive doses, 5 to 7 days prepartum, FIDY Type 142-F has been found to maintain blood calcium above the low levels that occur with Milk Fever.

You can now offer special rations or FIDY itself as an aid in preventing Milk Fever. Several feed manufacturers offer a special Milk Fever prevention ration containing FIDY to help complete their line of dairy feeds and provide another service to dairymen.

Free Vitamin D Portfolio

Do you have the current monthly letters with digests of recent research and other information on vitamin D, calcium and phosphorous in the nutrition of dairy cows by Dr. G. C. Wallis, well-known nutritionist? Additional sets are available in portfolio form. Address STANDARD BRANDS INCORPORATED, Dept. FS-1158, Agricultural Department, 625 Madison Avenue, New York 22, New York.

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IRRADIATED DRY YEAST
RICH IN VITAMIN D FOR FOUR-FOOTED ANIMALS

MORE Questions farmers ask about
vitamin D nutrition

Q: Would more vitamin D help keep my good producing cows in the herd longer?

A: The exact requirements of dairy cows for vitamin D are not known. Research with radioactive materials indicates that the ability to absorb and utilize calcium decreases markedly as cows become older, also that the availability of calcium reserves decreases with age. Since vitamin D is needed for the efficient use of calcium and also of phosphorus, it would appear that more vitamin D (up to 6,000 to 8,000 units per pound of regular ration) plus adequate calcium and phosphorus may help cows to produce profitably longer.

Q: When feeding massive doses of vitamin D_2 for milk fever prevention, should all cows in my herd be included?

A: No. For efficient herd management, only those cows with a previous history of milk fever or mature cows in herds where the incidence is high should be fed the massive doses of 30,000,000 units of vitamin D_2 per day for 5 to 7 days before freshening.

Q: How much vitamin D should my calves be getting?

A: According to work at the Pennsylvania Experiment Station, a minimum would be 400 to 500 units for each 100 pounds of body weight. Better growth and better looking calves were obtained when an additional 2,000 units of vitamin D per 100 pounds of body weight were added. Customary levels of vitamin D fortification for calf meals usually range from 1,000 to 4,000 units per pound of feed.

Q: Is vitamin D needed for protection against stress factors in swine feeding?

A: Yes, indeed. Rapid growth, early weaning, large-scale feeding operations under dry-lot and confinement conditions all create nutritional stresses in growing pigs which must be met by more highly fortified feeds, including adequate vitamin D. Multiple farrowing, large litters, and thyroprotein feeding to stimulate milk flow are examples of stress factors in sows for which ample vitamin D is indicated.

Q: How much vitamin D should my growing pigs be getting?

A: Increased rate of growth, early weaning, and confinement rearing as practiced in modern swine management indicate a need for more vitamin D. Further studies on vitamin D requirements of pigs under these conditions are needed. Many nutrition authorities recommend the fortification of pig starters and growing — fattening rations at about 500 units per pound of complete ration with somewhat higher amounts for the early weaned pig.

A. C. Wallis

Have You a Question?

If you have questions about animal nutrition concerning vitamin D fortification or Milk Fever prevention, write to Dr. G. C. Wallis, Director of Nutrition, Agricultural Department, Standard Brands Incorporated, 625 Madison Ave., New York 22, N. Y.

Standard Brands Incorporated
New York 22, New York

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Grant Made to Continue Ruminant Studies Using New Fistula Technique

NEW YORK—Michigan State University has accepted a grant-in-aid from American Cyanamid Co. to continue its ruminant studies with a newly developed technique that will almost literally enable the scientists to pinpoint areas in the cow's digestive system where vital nutritional functions take place, American Cyanamid announced.

The technique, called the rumen-duodenal fistula, consists of two surgical openings in the animal's body from which feed can be taken out for analysis. One opening leads into the rumen; the other, into the duodenum, the first part of the small intestine leading from the stomach.

According to Drs. C. A. Lassiter and C. F. Huffman, who will supervise the studies, the use of this new technique will open up heretofore unexplored avenues of nutritional research and provide valuable information about the proper feeding of ruminant animals.

Since the cows will have both a rumen and a re-entrant duodenal opening the Michigan State scientists expect to obtain much needed information on the site of absorption and metabolism of proteins, carbohydrates, fats and water. This means they will have an opportunity to determine where in the digestive tract these important body functions take place and to what degree.

With the advent of such compounds as urea as sources of protein, valuable information on their utilization by ruminant animals may be obtained from the studies. The fistula animals may also clarify how tranquilizers, antibiotics and other drug compounds influence digestion and absorption.

Associated with Drs. Lassiter and Huffman on the project are R. S. Emery, C. W. Duncan and H. G. Conner.

E. L. Spahr

STAFF ADDITION — Specifide, Inc., Indianapolis, manufacturer of pharmaceuticals for poultry and livestock feeds, has announced the addition of E. L. (Jerry) Spahr to its staff. He will represent the firm in Indiana. He is a graduate of Iowa State College, and he has been connected with the feed industry more than 30 years. Mr. Spahr will sell Specifide's complete line of feed pharmaceuticals and animal health products, the announcement said.

Cargill, Inc., Names Hybrid Distributor

MINNEAPOLIS—The hybrid corn department of Cargill, Inc., has named Arthur R. Cone, Inc., field seed wholesaling firm of Buffalo, as Cargill hybrid distributor in the northeastern U.S.

Donald B. Butler, general manager of Cargill hybrids, said the expansion will add nine states—New York, Vermont, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and northern New Jersey and Pennsylvania — to Cargill's 14-state sales area.

"Our entry into this important corn-producing area—where 130-million bushels have been harvested this year—represents a major expansion," Mr. Butler said. "We're confident the Northeast will play an increasingly important role in producing corn for feed and market."

USE OF FATS IN FEED IS GROWING

...with the Allied Industry Associa... committee regarding the tentative purchasing guides under consideration. With their approval, the following purchasing guides were accepted:

ANIMAL FAT PURCHASING GUIDE

Prepared by the Nutrition Council of the American Feed Manufacturers Association.

Foreword: This purchasing guide is presented to supply a uniform basis for the preparation of the procurement specifications by each purchasing agent. Since conditions and requirements vary greatly in different areas, this guide is not intended to be rigidly followed. Quality limitations may not always be optimal. The purchasing guides will be revised as improved methods of judging quality are available.

Definition: (Reference — Official Publication of the Association of American Feed Control Officials.)
Animal fat is a mixture of fats of a quality suitable for feeding obtained from animal tissues in the commercial processes of rendering. If the product bears a name descriptive of its kind or origin as for example, "lard," "tallow," "beef fat," it must correspond thereto.

Analysis: (Basis American Oil Chemists' Society, current edition unless specified.)

1. Stability: AOM Test (Active Oxygen Method)
20 hours AOM stability is the minimum acceptable and is approximately equivalent to 320 days of storage life.
2. Purity: M.I.U. (Moisture, Impurities, Unsaponifiables)
The M.I.U. is basis 2% unless otherwise specified. Excessive moisture causes rapid deterioration and must be kept out of animal fat. Higher percentages of impurities proportionately reduce caloric values.
3. Antioxidant:
Only approved antioxidants shall be used, and in sufficient quantity to meet minimum stability requirements.
4. Free Fatty Acid: (FFA)
Free fatty acid varies but for feeding purposes, animal fats having a free fatty acid not exceeding 15% are usually selected.

Physical Properties:

1. Color:
Color is an indication of grade, but has little or no effect on feeding quality.
2. Titer: (Approximate Melting Point)
Titer is the solidification point of the fatty acids measured in degrees centigrade. Fat having a titer of 40° C. and above is called tallow. Fat having a titer below 40° C. is called grease.

Tenox

Eastman antioxidants for animal fats

Make sure the fats you buy meet new AFMA "specs" on stability. Insist on Tenox-stabilized fats for your feed.

With more and more feed manufacturers recognizing the nutritional advantage of incorporating animal fats in their feed, consumption of these fats is growing rapidly. But with this increased consumption, there also has grown the necessity for consistently obtaining fats of adequate stability.

Recognizing this problem, the American Feed Manufacturers Association has suggested new standards of quality to guide purchasing agents in buying stabilized animal fats.

By these new standards, the *minimum* acceptable fat stability is set at 20 hours by AOM test. The trend among leading renderers, however, is to produce a 40 hour AOM fat. By so doing, these renderers provide maximum assurance the fats they sell will have sufficient stability, even under adverse conditions.

Not all antioxidants can provide even 20 hour stability under all conditions. And, with the wide variety of inedible fats and meat scraps being processed today, it is to your advantage to make sure the fats you buy are protected by the proper antioxidant.

Tenox antioxidants give you the safeguard you need.

In the first place, the Eastman line of Tenox antioxidants offers the renderer the widest choice available. From this broad range he can consider and select the antioxidant or antioxidant formulation best suited to the particular fat he is handling and to his processing conditions.

Secondly, Eastman is well-qualified to suggest not only the most effective antioxidant formulation, but also the most efficient method of adding it. This is because Eastman has years of experience in the manufacture and use of antioxidants, and in evaluating their performance. Eastman makes all the major types of antioxidants—has no axe to grind in favor of any one.

So insist that your renderer supply fats stabilized with Tenox antioxidants, backed by Eastman technical service. It's your best assurance the feeds you sell will have long-lasting protection against rancidity. EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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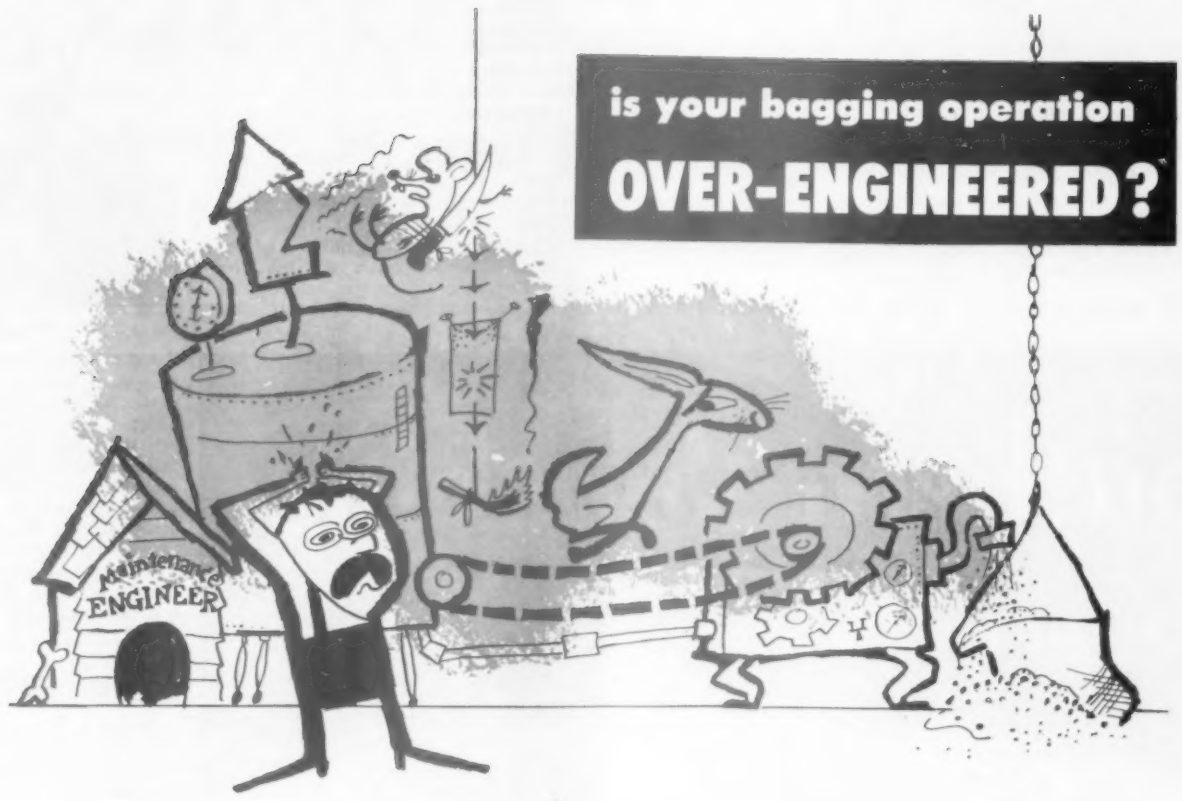

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- **HIGH PRODUCTION!** Up to twenty 25-lb. or 50-lb. bags per minute, or twelve or more 100-lb. bags, with accurate weight.
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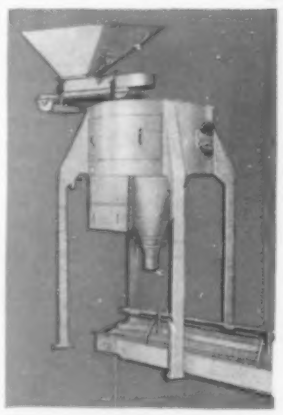

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Less Favorable Poultry Outlook Reviewed

FAYETTEVILLE, ARK. — Poultry prices don't look as favorable in the months ahead as they have in the past, according to W. J. Windham, assistant agricultural economist with the Arkansas Agricultural Experiment Station.

At the second annual Poultry Study Day Mr. Windham presented the following review of trends in supply and price of broilers, eggs, and turkeys:

BROILERS: It is expected that broiler production in 1958 will exceed the 1.5 billion birds produced in 1957 by about 16%.

Chick placements this year have averaged considerably higher than in 1957. Placements slackened during August and September but picked up again in October. Eggs in incubators are currently 15% above a year ago. These facts indicate continued large supplies of broilers through the remainder of this year and extending into 1959.

Farm prices for broilers from October through December of this year are expected to average 15@16¢ lb. This would be 1@2¢ below the same period last year.

Factors that strengthened the early 1958 market will probably be missing in early 1959. These were unusually high mortality and slow growth which reduced broiler supplies, and a relatively short supply of red meat which increased demand for broilers.

Some decline in feed cost is anticipated, but not enough to offset the margin of lower market prices, he warned.

EGGS: Size of the laying flock on Jan. 1, 1959, is expected to be about 2 to 4% above Jan. 1, 1958.

In the next few months, the combined effects of larger flocks and increased rate of lay—due to a large proportion of pullets—may result in monthly production 3 to 5% greater than corresponding months a year earlier.

It has been predicted that farm prices of eggs, from October through December of this year will average 38¢ doz. For the first six months of 1959 they will average about 31¢, with the lowest price occurring between April and June.

TURKEYS: The number of turkeys raised in 1958 is estimated to be 4% less than in 1957, Mr. Windham continued. Heavy storage stocks are holding down current turkey prices despite smaller slaughter.

In view of the late hatch and expected heavy slaughter in November and December, there is little chance for a seasonal price rise, except as a reflection of superior weight and finish of older birds.

Prices in November and December will rise less than normal for the season, and will probably hover around 25¢, he said.

It appears that more turkeys will be raised in 1959 than in 1958. The number of potential breeder hens is greater and there is plenty of feed. He predicted that if the increase should be more than about 3%, it's quite likely that 1959 prices will be lower than 1958 prices.

George A. Schoen

SALES RESPRESENTATIVE — George A. Schoen, former vocational agriculture instructor, has been appointed sales representative in western Wisconsin for Holt Products Co., Milwaukee, manufacturer of vitamin, antibiotic and trace mineral premixes for use in poultry and livestock rations. Mr. Schoen is a graduate of the University of Minnesota and has been a member of the high school staff at Houston, Minn., for the past four years.

Potatoes Fed to Steers In Oregon Experiment

CORVALLIS, ORE.—Experiments at Oregon State College have recently shown that potatoes can provide the bulk of rations for yearling steers.

Test steers were fed out to market grades with an average intake of 75 lb. of potatoes daily, a little straw for roughage, and 2 lb. of protein supplement.

All but one of the test animals reached a "good" or "choice" grade during the 125-day feeding period. Feed costs per pound of gain were about 25% lower than for comparative steers on a standard finishing ration of alfalfa hay and ground corn.

Details of the work are reported in a circular, "Potato Diets for Fattening Cattle," written by E. N. Hoffman, superintendent of the Malheur branch of the experiment station, and Dr. J. E. Oldfield, OSC animal nutritionist. Copies are available from county extension offices or the Oregon State College bulletin clerk, Corvallis, Ore.

Southern Sunshine

PROCESSED PEANUT HULLS

"Nature's Perfect Poultry Litter"

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ANDERSON BOX CO.

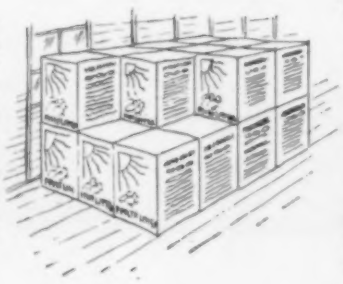
During the past twenty years Southern Sunshine has earned the enthusiastic endorsement of hatcherymen and turkey growers as the finest poultry litter available.

Now Anderson Box Company is proud to announce that it has acquired exclusive sales rights to this outstanding product. The B. J. Gibson Co., which has handled Southern Sunshine sales for many years as representative for Gold Kist Peanut Growers, will be affiliated with Anderson Box under this new arrangement.

Anderson Box makes this pledge to Southern Sunshine customers: The fastest possible delivery at low, economical prices!

ECONOMICAL...EASY TO STORE

Southern Sunshine is competitively priced and money-saving from a labor standpoint. It comes in 20″ x 20″ x 24″ corrugated cartons that are easy to handle and stack. Each carton, packed by special compressor equipment, contains enough litter for 120 sq. ft. of floor space.



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Southern Sunshine pours easily, expanding into a huge pile for fast spreading. No lumps to break up . . . no roots or vines . . . nothing but clean peanut hulls. When litter is spent, its light weight makes it easy to remove with a shovel.

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U.S.I. FEED NEWS®

Vol. V ★ A SERIES FOR SCIENTISTS AND EXECUTIVES OF THE FEED MANUFACTURING INDUSTRY ★ No. 11

Methionine Improves High-Fat Poultry Feed

Addition of DL-methionine to a variety of fattening rations for poultry showed increased weight gains in recent experiments. Added methionine showed the greatest dollar value and weight gains when up to 6% fat was added to standard rations. Efficiency of feed was improved by methionine in all high-energy rations.

Choline Helps Control Mink Wet-Belly Disease

Recent mink feeding trials showed that a ration high in choline and low in fat made a marked reduction in wet-belly disease. The source of choline used in the rations also supplied vitamin E and B-vitamins. Since the vitamin-containing supplement did not completely control wet-belly, other factors must be involved. Until more information is available, severity of the disease can be reduced by using lean meat, fish and cottage cheese to reduce fat in rations, along with fortified cereal or other sources of choline such as U.S.I. Choline Chloride.

Kidney Damage Results From Choline Deficiency

Recent research with experimental animals fed choline deficient rations showed definite damage to the kidneys within 6 days. Increased lipides showed up in the kidneys within 2 days. Renal damage continued to increase after 6 days on the deficient ration. Vital importance of choline to good health in young animals is indicated.

Ethanol Is Shown to Increase Gains Made by Beef Animals on Test Rations

Source of Protein was Synthetic Nitrogen

Recent wintering and fattening studies with beef cattle showed significant weight gains for cattle fed a ration containing ethanol plus either urea or ammonia nitrogen as a source of protein, as compared to animals on a check ration without ethanol and with oilmeal as a source of protein. Rations were fed free-choice.

MOREA liquid feed is a patented product containing ethanol, urea, phosphoric acid, molasses and trace minerals. It is sold to feeders only by specified mixer-distributors. For information on sales territories, write U.S.I.

The liquid feedstuffs used contained ethanol and some of the other ingredients of the commercial, patented feed product known as MOREA® liquid feed. However, the trace minerals used in MOREA liquid feed were not included in the test rations.

Significant Gain

The increased weight gains shown by the animals getting ethanol were considered significant when examined by modern methods of statistical analysis. Comparison of the rations was based on a total of more than 11,000 animal feeding days.

Rate of gain was termed satisfactory in all lots of cattle. Sorghum silage, sorghum grain and prairie hay were used in all test rations, along with salt and limestone or salt and bonemeal.

Ethanol and Urea Best

Over the entire wintering and fattening period, average daily gains on the rations containing ethanol were better than those on identical rations without ethanol. Also, in all cases, the rations containing urea as a source of protein nitrogen gave better gains than rations containing ammonia as a source of nitrogen. The results of these studies point out again the value of the ingredients contained in MOREA liquid feed, which contains ethanol, urea, molasses, phosphoric acid and trace minerals.

Study Relationships of Vitamin E, Methionine and Selenium in Feeds

Recent experiments with lambs and chicks show that vitamin E and selenium are both useful in reducing muscular dystrophy. Tests with chicks on control of hemorrhagic disorders also show a relationship between vitamin E, methionine and selenium. Most feed grains contain adequate selenium, however, but vitamin E and methionine supplements are often essential. (See Feed News, Vol. V, No. 7.) For full information on vitamin E and Methionine, write for U.S.I. Buyers' Guide.

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Feed Firm Offers Customers Well Rounded Milling Service

Pelleting, portable and custom milling, bulk service and good promotion put firm in "competitive, profit-making situation"

By Al P. Nelson
Feedstuffs Special Writer

In 1948, one year after the Preston (Iowa) Feed Mill installed a pellet mill, 25% of the firm's line of manufactured feeds were pelleted.

Today, 11 years later, 80% of the firm's brand of feed is pelleted. Recently a new and larger pellet mill was installed to handle the growing volume.

CRUMBLES—A Preston Feed Mill employee is shown looking over crumbles put out by the firm as part of its line of Badrick's Feeds.

Vernon Badrick, a director of the Western Grain & Feed Assn., and his brother, Harry, own the mill, which was established by their father in 1922. Vernon anl Harry have been sole owners since 1928, and they have been progressive businessmen.

"We could see the benefits of pelleting," Vernon said. The result was the installation of a California pellet mill in 1947. Their customers liked the service, and growth was assured.

"Many of our cattle and hog men like pelleted feeds," Vernon said. "Poultry raisers like crumblized feeds, but our largest volume of feed business is with hog and cattle feeders."

Special Molasses Device

The Badricks have developed a special device which helps them to incorporate as much as 30% molasses in some of their pellet feeds. This, they said, is accomplished by piping the hot molasses and hot fats directly to the pellet mill. The quick blending at this point along with the pelleting process gets the molasses into the pellet with uniformity, they said.

The 30% molasses feeds are used mostly by dairymen and also by some cattlemen.

"By mixing the molasses this way, we avoid gummy feed at higher molasses content levels," says Mr. Badrick. "Many dealers and salesmen visit our plant to see how we accomplish this operation. It works well for us summer and winter on pelleting."

WELL-ROUNDED FEED SERVICE—The Preston (Iowa) Feed Mill offers a well-rounded service to its customers. Besides producing its own line of feeds, it has a custom milling service, pelleting, portable mill service and a farm store. This is the exterior of the long Preston Feed Mill building. The farm supply store is in the front portion. A scale is under the canopy at right.

The firm has a 15,000-gal. molasses storage tank and also a Strong-Scott molasses mixer. In addition, there is a molasses blender in a second floor custom mixing department.

The Badricks have one production line for their own brand of feeds. Vernon said that they give their feeds a long mixing time, which customers like.

The firm handles Ful-O-Pep feeds in addition to its own brand.

Equipment

Equipment used in making the firm's line of feeds includes a Big Chief 60-h.p. grinder and a two-ton Marion horizontal mixer. Other equipment includes a Union special bag sewer, Roskamp huller and roller, Clipper seed cleaner, and two weigh buggies. The firm also has a 25-ton Howe scale.

"We can use our production line to make our own brand of regular as well as pelleted or crumblized feeds," states Mr. Badrick. "We also have pellet or crumblized feeds for customers who want special formulas. For instance, one cattle raiser orders five tons of fresh feeds three times a week. He buys from us because we make up the feed the way he wants it and deliver it to him fresh—in bulk, of course."

A breakdown on the firm's feed business is as follows: Beef cattle, 50%; hogs, 40%; dairy, 5%, and poultry, 5%.

Custom Mixing

While they make their own line of feeds, the Badricks do not turn away any custom business. But they have a separate department for such mixing. It is on the second floor, with dual controls for this department on the first floor as well as on the second.

Equipment in this department includes a two-ton Sidney mixer and a molasses blender. There is a 15,000-gal. molasses storage tank in the custom mixing department and the big storage tank in the basement.

Custom grinding and mixing accounts for about 3,000 tons volume

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Off-center weights are used on both sides of the body for the purpose of vibrating the last portion of the feed off the sides. The three middle angle braces support the side of the body with rubber strips allowing free vibration of the sloping sides.

TRIPLE CONVEYOR SYSTEM
The Helm truck body has three conveyors in the bottom of the body, powered from the power take-off with double ¾" pitch chain. The conveyors in the bottom are equipped with a clutch so any one of them can be driven individually according to capacity desired.

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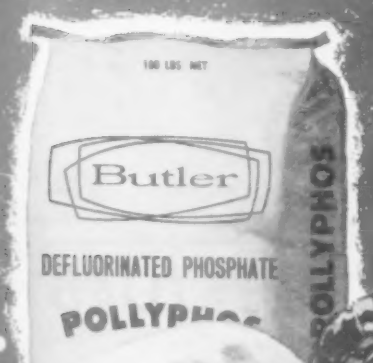

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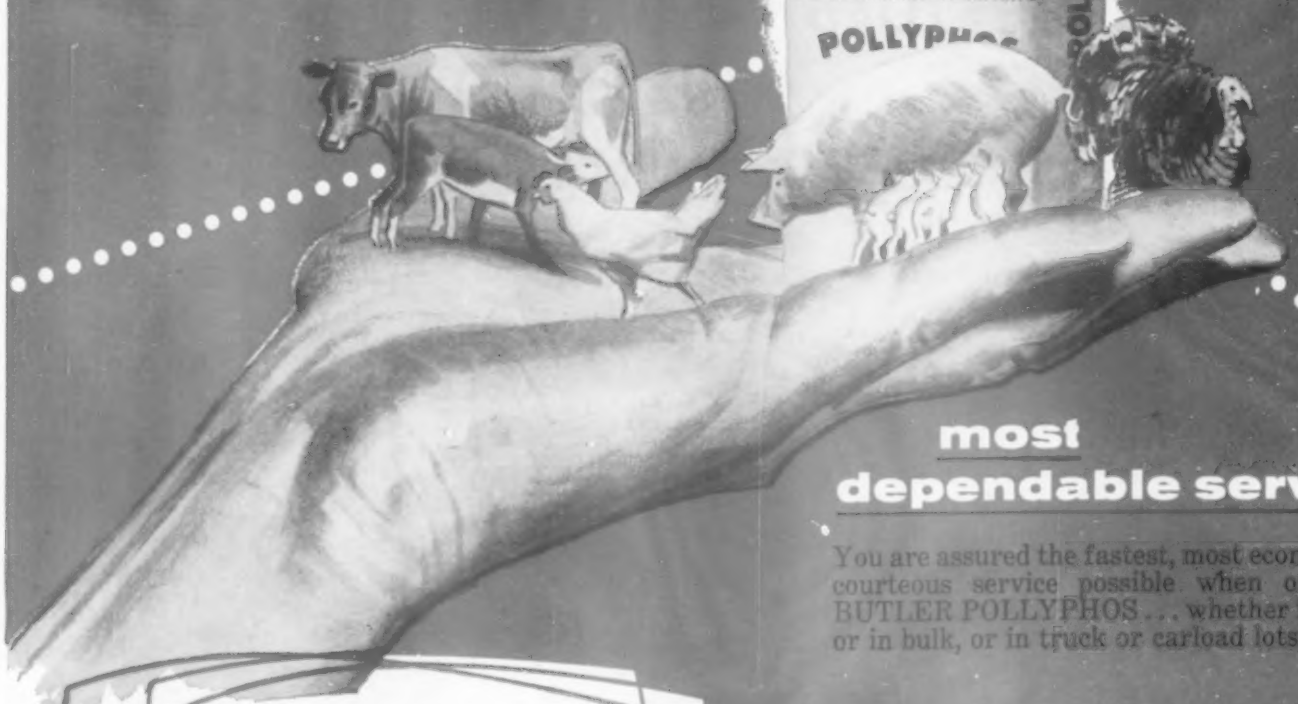

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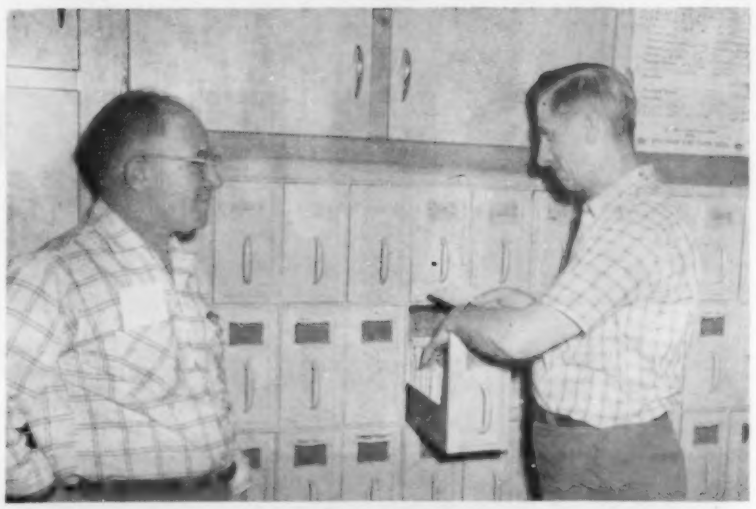

EFFICIENT FILING SYSTEM—Vernon Badrick talks over a filing problem with the company's bookkeeper. But filing problems are minor for the firm, which has an excellent filing system with many special metal cabinets, adequately marked, for keeping records. There is another wall filing section like the one shown above. Note the plywood cupboards above for additional records, books and office supplies.

annually, while the firm makes about 6,000 tons of its own feed annually.

Vernon Badrick said the firm has 105,000 bu. of storage capacity, some of it in government corn. It also has five bulk trucks, and all of them are also used for hauling grain to and from farms. Even when farmers in this region are picking corn, the Badricks frequently haul corn to farms.

Bulk Delivery

The Badricks have been using bulk feed delivery for seven years and find it helps them serve the larger feeders very well. Seventy per cent of the feed delivered to farmers by the firm is bulk, representing quite an increase during the last five years.

A large amount of the feed delivered to farmers goes into large feeders, some holding 350 bu. Some of the larger feeders are now having lumber companies build 75-foot-long feeders for them. Several feeders have holding bins on their farms into which the Badricks put feed.

The firm also has two John Deere corn shellers which operate seasonally in the territory. In addition, it has two outside salesmen who travel a wide area selling feeds and services.

To make sure they don't miss any business-building bets, the Badricks also have an Iowa portable grinder which travels the area, grinding for farmers who want this service. There is no mixing unit on the grinder. The firm has been offering this service for 25 years, and now has its third grinder.

Prices charged are $10 per hour, or $6.50 per load, depending upon size. Vernon says this portable machine helps the firm service farmers in the outlying territories. The serv-

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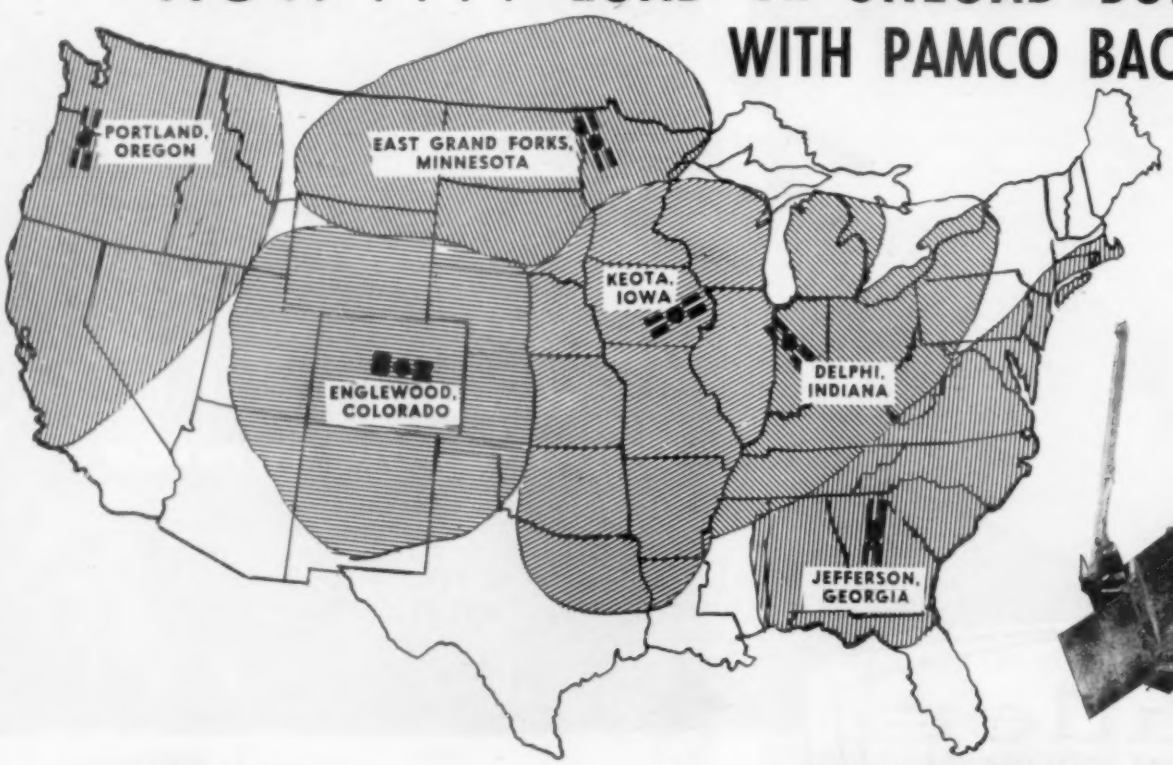

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DaweNzyme extensively tested by state experiment stations and proved commercially, is an economic boon to those where barley is available for less than corn. With DaweNzyme, barley can be the principal grain without the former penalties of lowered growth and feed efficiency, compared to corn.

DaweNzyme is easily incorporated in the feed formula. It is a dry, free-flowing, stable material. No special handling is involved and ordinary mixing procedures are followed.

While attention has been focused on barley, tests show small, but consistent, improvements in the utilization of corn itself, when supplemented with DaweNzyme.

1956 ... Dawe's began research and development on the application of enzymes to nutrition.

1957 ... April ... Washington State College reported starch-digesting enzymes improved nutritional value of barley in poultry feeds.

1957 ... July ... Dawe's publicly announced DaweNzyme as the first commercially available enzyme system for feed application.

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PELLETING — Vernon Badrick, who with his brother owns and operates the Preston (Iowa) Feed Mill, is shown here (left) with an employee by the firm's new pellet mill. Heated molasses and fats are piped directly to the machine.

ice also helps to sell other feeds to portable grinding customers.

The Badricks are doing everything they can to get the most business from their area, and they are succeeding very well. Pellets, crumblized feeds, custom grinding and mixing, bulk service, portable grinding service, and the like—these are some of the means used by this enterprising firm to keep it in an excellent profit-making and competitive situation.

It requires 18 to 20 employees to operate this enterprise. Relations between employers and employees are excellent.

Promotion

To back up their intensive merchandising and service program, the Badricks spend about 2% of the previous year's gross on advertising and sales promotion.

While some newspaper advertising is used, the Badricks say they like direct mail. They use a 5 by 6 in. semi cardboard mailing under the bulk rate quite often. Usually, they send out 1,200 copies of these direct mail pieces. Sometimes a promotion goes into the mail every three weeks.

Vernon said about 50% of the ad budget goes into two newspapers, and about 25% is used for direct mail. The other 25% is for sales promotion, miscellaneous ads, etc.

"I think the independent feed dealer should advertise regularly," Vernon states. "He's got lots of profitable things to tell the customer."

The firm's direct mail sheets advertise that bulk feed costs $5 ton less. Ton lots are $1 off, and when a buyer hauls his own he gets it for $2 less.

"We think our business has a good future," Vernon said. "We are close to many big feeders and we can give them exactly the kind of feed and service they want. We like to take operators of large and small feeding operations through our mill. We show them exactly how we make our own brand of feed and how we custom mix. We also stress our long mixing time to give them the best feeds they can get for their livestock and poultry operations. They appreciate our showing them these things. A small mill can conduct this type of public relations work, and it pays very well."

A sizable farm supply store is located in the front part of the mill. Livestock and poultry remedies especially get excellent showing. There are also several chairs along a wall where farmers can sit and talk feed problems with the owners.

John Zucker

HONEGGER FIRST—John Zucker, Madison, S.D., has been named the first Honegger district sales manager for the South Dakota area, according to an announcement by Elmer S. Roth, vice president and general sales manager of the firm. During the three years previous to his association with the Honegger organization, Mr. Zucker served as sales representative for a feed manufacturer. Prior to that, he was in charge of chick sales for Zucker's Scribner Hatchery, a business in which he was in active partnership with his father and brother in Scribner, Neb.

Named to Oregon Post

SALEM, ORE.—Dr. Lewis E. Bodenweiser, Salem, assistant state veterinarian for the past three years, has been given a temporary appointment as supervisor of the department of agriculture's disease control and meat inspection. Robert J. Steward, Oregon director of agriculture, explains that Dr. Bodenweiser will fill the post until a state veterinarian is found to succeed Dr. Kermit J. Peterson, who resigned in protest against the department.

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PERMA-MIX Recommended combinations of vitamins and antibiotics; also blended according to customers' formulas. Trace minerals added as requested. Only Perma-Mixes are made with the Perma-Vitamins.

PERMA-SOL Water dispersible vitamin and antibiotic products of recommended formulas or custom mixed. Designed for farm animals too sick to eat. An effective booster at critical times.

U.S. Patent No. 2496634 and others pending

Literature supplied on request

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Jack Busby Named to Cargill Trucking Post

MEMPHIS, TENN.—Jack L. Busby, who has been serving as manager of the commodity department for Cargill, Inc., here, has been transferred to home offices in Minneapolis. He will be manager of trucking for commodities and company-wide coordinator of trucking.

Mr. Busby has been with Cargill since January, 1957. From Marysville, Mo., he was graduated from the University of Missouri. He came to Memphis a year and a half ago.

Succeeding him in Memphis is Lawrence C. Taylor, who came here in October, 1957, three months after joining the firm. Mr. Taylor, of Santa Barbara, Cal., was graduated from the University of California and later attended the American Institute for Foreign Trade at Phoenix, Ariz.

David Kirk, who has been serving with the Cargill traffic department in home offices, has been appointed assistant manager of the commodity department and merchandiser of molasses. Mr. Taylor previously held those duties. Mr. Kirk, from Knoxville, Tenn., was graduated from the University of Tennessee, and joined Cargill 2½ years ago.

Arkansas Broiler Boom

FAYETTEVILLE, ARK. — Arkansas set a new high in broiler production during the past year, according to a report on 1957 agricultural statistics released recently. Broiler production exceeded the state's previous record by 11%. The 1957 cotton crop was the smallest since 1935, but the state's farmers harvested 32.5 million bushels of soybeans, 20% more than 1956, also a record.

Iowa Firm Opens New Feed Plant

BEDFORD, IOWA—Formal opening of the new feed manufacturing plant of the Lucas Products Co., Bedford, was held here Oct. 25. Featured as the guest speaker at a dinner the evening preceding the opening was Lloyd Larsen, executive vice president of the Midwest Feed Manufacturers Assn., Kansas City.

Lucas Products Co. recently purchased the Cudahy Packing Co. produce plant in Bedford and has completely remodeled the plant and facilities. The new site has over 27,000 sq. ft. of floor space. When completed, the facility will be a completely modern feed manufacturing plant, Vane B. Lucas, general manager, announced.

NEW DIRECTORS NAMED

SHERIDAN, ORE.—Sheridan Grain Co. has elected Clay Starns and Pearl Blackwell as directors for two year terms, replacing Robert Smith and Ivan Dent, who have served as directors in the company for 16 and 20 years, respectively. Walter W. Werth and John Rogers were reelected for two year terms. Robert Guttry, John Duerst and Sherman Wertz are other directors.

James G. Jackson

James Jackson Heads Chase Sales Branch

NEW YORK — James G. Jackson has been appointed as sales manager of the St. Louis branch of Chase Bag Co. which serves portions of seven states.

Mr. Jackson has been with Chase 10 years, serving industrial and agricultural buyers the firm's complete line of products in the St. Louis area. He is a graduate of Washington University, where he majored in business administration, and is well known in industry circles as an amateur golfer, having held several midwestern championships in addition to membership twice on the U.S. Walker Cup team.

Mr. Jackson, as St. Louis branch manager, will be responsible for sales in portions of Missouri, Iowa, Illinois, Indiana, Kentucky, Tennessee and Arkansas. The announcement of his appointment was made by W. N. Brock, vice president and general sales manager.

Conveyor System Saves Time, Report Shows

BURLINGTON, VT. — Another progress report on a conveyor system for dairy cows in pole-type barns has been given by Edwin C. Schneider, chairman of the agricultural engineering department, University of Vermont, which designed, built and is testing the system.

The first progress report on the system was published three years ago.

Mr. Schneider, in an article in the Vermont Agricultural Experiment Station's publication, said, "In tests with eight cows in stanchions, as much as 80.2% of time and 88.2% of travel were saved by conveyor feeding compared with hand feeding."

The supply conveyor begins under a hay pitch hole from the overhead hay mow and runs past the silo, carrying feed to a manger conveyor. A silo unloader automatically delivers the desired amount of silage for each cow, then stops. A buzzer lets the operator know when the proper amount of hay has been pitched down.

"The remainder of the operation is automatic," according to Mr. Schneider. "When the feed reaches the last cow, the system ceases to function and is ready for the next feeding cycle.

"An electric fence trainer keeps cows from eating feed as it goes past them. The fence swings out of the way after conveyors stop, letting the cows eat."

From the research laboratory

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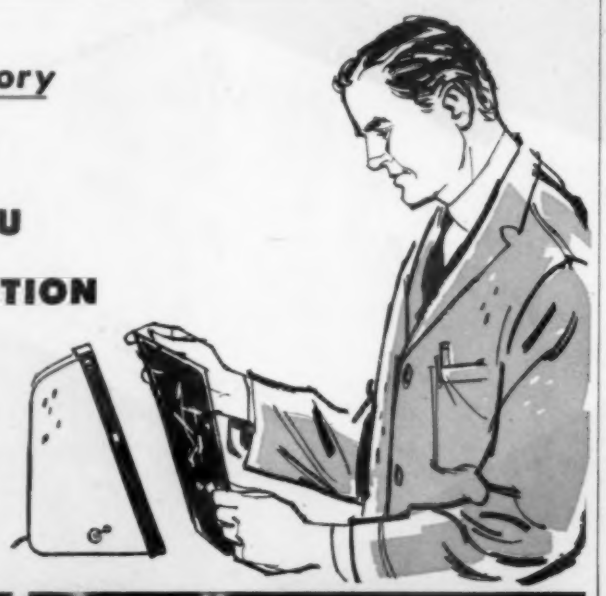
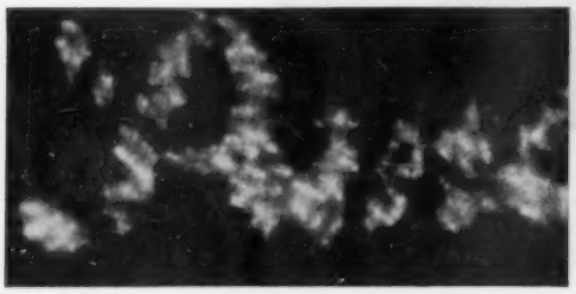
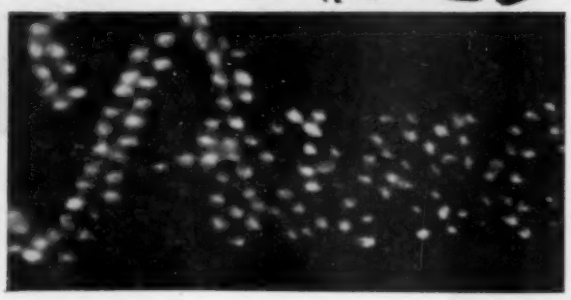
This striking method of photographing the actual vapor action of Panogen was developed by Swedish scientist Dr. Olle Lindstrom. He compounded a special radioactive Panogen, which was then applied to seed. This seed was then placed on a photographic plate, with the result that the Panogen vapors actually photographed themselves. No other light source was used.



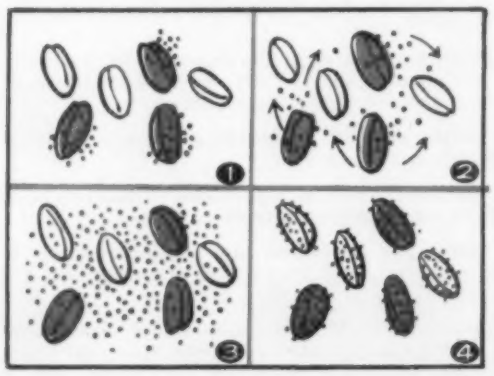




The photo, upper left, shows the effect of Panogen vapors at the time of application. The vapors are already beginning to cover every kernel of seed.

In the photo above, you see the seed a few hours later. Note how a protective film of disease-destroying fungicide now completely covers and protects each kernel of grain.

IT'S THE VAPOR ACTION!



Panel 1. Immediately following treatment: Most seeds show red areas and faint red coloring. The black dots indicate the millions of disease-destroying molecules which cling to each colored seed.

Panel 2. A few minutes after treatment: Vapors are beginning to spread, making contact with adjacent seeds. Note movement of vapors carrying fungicide molecules to seed surfaces that may have originally had less treatment.

Panel 3. A couple of hours after treatment: Vapors from the treated seeds have completely enveloped all seeds. These vapors penetrate every crack and crevice where disease spores may be lodged.

Panel 4. 24 to 48 hours after treatment: Disinfection is complete, thorough, permanent. The vapors carry no red dye, therefore, red coloring may not be visible on all seeds, but each kernel has been completely coated with the Panogen vapor. A chemical binding action locks this protection on every seed.

When you sell or process seed, your reputation is at stake. Thorough protection from disease is *business* protection for you.

Panogen is used by agricultural authorities throughout the world as a standard for testing new seed-treating products. This is your assurance that when you treat with Panogen, you are using the best available fungicide.

For a more detailed description of Panogen's vapor action, write for the free booklet, "The Benefits of a Modern Seed Treatment."

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- **Close PERSONAL Sales and Office Assistance**
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- **Geerlings EXPECT Dealers To Make Good Money**

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Geerlings Feed Mills . . . a company built from the ground up by FULL TIME FEED MEN! This company was built by men who STARTED in the feed business as SALESMEN.

Geerlings personnel KNOW the feed business from YOUR side of the counter. They know some of the problems YOU face every day . . . and how to help you solve them.

Mr. Geerlings spent thirteen years selling feed farm to farm. He knows what it takes to do a profitable job of converting feed into meat, milk and eggs. And he still spends a lot of time in the field — keeping his hand in the feed selling phase of the business.

★ With Geerlings, their ONLY business is feed.

★ Geerlings buy ALL the ingredients used in making their feed.

★ Geerlings intentionally entered feed manufacturing and selling — not by accident to use a by-product from their major business.

Geerlings Feeds are formulated with ONE basic purpose — help the feeder get the cheapest cost per pound of gain, 100 lbs. of milk or dozen eggs. Price per ton is second — RESULTS ALWAYS come first with Geerlings. Just ask some of the present Geerlings Dealers . . . they know because they see the results day after day right in the feed lots.

GEERLINGS DEALER BENEFITS

1. A simple, efficient feeder credit plan.
2. A complete line of livestock and poultry feeds.
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4. Up-to-date, practical research farm.
5. Quality products recognized by repeat customers.
6. Big enough to serve, small enough to receive personal attention.
7. Servicemen available 24 hours — no charge to dealer or feeder.
8. Program designed so dealer makes good money.
9. Feed formulated to give feeder cheapest per lb. of gain.
10. Heavy, *localized* advertising and sales promotion help.

* Television, Radio, Magazine, Direct Mail, Local Newspaper.

Why Shouldn't YOU too . . . SWITCH TO GEERLINGS?

Like to run your own business? Like to make money in the feed business? Like to do a good job of assisting your feeders make money? Like that repeat business week after week?

If you prefer to have these factors in your favor, we believe it good business to drop us a line. Just give us 30 minutes of your time to show YOU, too, how to make more money in the feed business. Can you afford 30 minutes out of your day? Might be a very profitable half hour! Drop us a letter. We'll take it from there.

YOU Can Have Confidence In Your Geerlings Man!

Geerlings Famous 3-Step Bacon Makin' Hog Feeding Program!

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3 STEP FEEDING PLAN

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MICHIGAN SCENES — New officers of the Michigan Grain & Feed Dealers Assn., elected at the 25th annual convention held jointly with Michigan State University, are shown (left to right) in the first picture. They are: Robert McConkey, Durand (Mich.) Milling Co., president; Ed Bauer, Little Brothers, Kalamazoo, vice president; Ray Bohnsack, Farm Bureau Services, Lansing, financial secretary; Nevels Pearson, East Lansing, secretary-treasurer. In the second picture, Miss Mary Wesley, a partner with her father, C. B. Wesley, in the firm of Wesley Grain, Sidney, Ill., was introduced to Lawrence Smith, left, Smith Bros., Lake Odessa, Mich., retiring president of the association, by George Greenleaf, director of the grain elevator and farm supply training course, Michigan State University. Her firm operates grain elevators at Broadlands, Block, Bongard and Longview, all in Illinois, doing a general grain business.

J. S. Gage Named GMI Vice President

MINNEAPOLIS—J. S. Gage, director of grain operations for General Mills, Inc., was elected a vice president of the company at the regular meeting of the board of directors Oct. 27. The announcement was made by C. H. Bell, president.

The newly-elected company officer joined GMI in 1932 in Minneapolis. Two years later he was transferred to Buffalo as a grain buyer. In 1943 he returned to Minneapolis as grain buyer for both the Buffalo and Duluth facilities of the company. Mr. Page was named manager of Buffalo and Duluth grain operations in 1949, and in 1950 was made vice president of what was then the eastern division of GMI. Three years later, he became assistant director of grain operations for the entire company, and in 1954 was named director of grain operations.

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SCRATCH and SCRAPS

The beautiful young lady went to the psychiatrist's office for her first visit. The doctor looked at her for a few seconds, then said: "Come over here, please." He promptly put his arms around her and kissed her. As he finally released her, he commented briskly, "That takes care of my problem. Now what's yours?"

◆ ◆ ◆

The weekend hacker carefully addressed the ball and swung—producing a hole in which you could have buried a truck. He picked up the huge divot, hefted it in his hand, then turned to his caddy:

"What do I do with this?" he asked

"Take it home," the boy sighed, "and practice on it."

◆ ◆ ◆

A couple celebrating their 20th anniversary were seated at the movies, watching one of those torrid foreign films. When they got home that night the wife turned to her husband coyly.

"Why is it you never make love to me like all those men in the movies?" she murmured.

"Are you crazy?" he replied. "Do you know how much they pay those fellows for doing that?"

◆ ◆ ◆

A Texas story now going the rounds concerns a man who struck oil, and, with his new riches, built a mansion and three swimming pools. One pool he kept filled with cool water and another with warm water; the third he kept empty. He explained: "A lot of my friends can't swim."

◆ ◆ ◆

Did you hear about the Texan whose son wanted a chemistry set for his birthday? His Dad bought him E. I. duPont.

◆ ◆ ◆

A minister looked at one of his parishioners coldly.

"I hear you went to a ball game Sunday instead of coming to church," he said.

"That's a lie," the man protested, "and I've got the fish to prove it."

- Stimulates appetite—adds aroma, taste appeal
- Stabilizes fat-bearing ingredients—guards vital nutrients—helps prevent vitamin deficiency diseases
- Eliminates bitter taste of additives
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ALABAMA

(Continued from page 46)

antibiotics. Aureomycin chlortetracycline and Terramycin oxytetracycline have been used more successfully than other antibiotics in feeding dairy calves. Some stimulation results under certain conditions from the use of penicillin, streptomycin, tyrothricin, and bacitracin. Results from the use of these drugs have not been consistent. In general, Aureomycin fed at levels ranging from 45 mg. to 250 mg. daily may stimulate calf growth to the extent of 15-20% until the calf is approximately 4-6 months of age. This growth stimulation is accompanied by a slight increase in efficiency of nutrient utilization.

At the Cornell Station, cows were fed 700 mg. of Aureomycin daily with no effects on the apparent appetite of the cows and with no detectible Aureomycin coming through in the milk. At this level of feeding, there was no effect on the coagulation of milk in cheese production. When cows were fed at the rate of 1000 mg. daily, some feed refusal was noted. When 100 mg. of Aureomycin was fed daily for an extended period of time, there were no harmful or helpful effects observed.

In studies at Kansas, 32 mg. of Aureomycin were fed per 100 lb. body weight per day (average daily intake 300-500 mg.). No effects were observed from the standpoint of the health of the animals, milk or fat produced, consumption of feed, bodyweight, pulse rate, body temperature or rumination.

In Michigan studies cows were fed 4 gm. of bacitracin daily or 3 gm. of Aureomycin daily with no significant effects on milk production level or appetite. Streptomycin was fed at rates from 1 to 10 gm. daily with no apparent effects on the experimental animals. Neomycin was fed with similar results. In Louisiana studies no benefits were obtained from feeding lactating cows Aureomycin or tyrothricin. There was no apparent secretion of these antibiotics in the milk produced. At the Louisiana Station also, a mature bull was fed 300 mg. of Aureomycin daily for 10 weeks. Investigators were unable to observe any effects due to the Aureomycin feeding on basis of number of ejaculates, volume of semen produced, percentage motility of sperm, concentration of sperm and breeding efficiency.

STATUS OF COCCIDIOSTATS IN POULTRY PRODUCTION—S. A. Edgar, API: During the past twelve years, several drugs for the control of coccidiosis have been made available to the poultry industry.

Initially, the search was for drugs that could be administered for short periods to control outbreaks. However, because of the usual course of outbreaks in the field, the development of drugs that could be fed continuously during the growing period offered more effective control of the disease than "spot treatment."

Combined with good management, the feeding of a low level of a coccidiostatic drug during the first nine to ten weeks is the most widely used practice for control of the disease in broilers.

Studies at Auburn have revealed that at least 7 of the 8 species of chicken coccidia are pathogenic, in that all cause morbid losses. At least two of the turkey coccidia are highly pathogenic. Even broilers of our area are more often than not exposed to at least 6 species of chicken coccidia and 2 of turkeys.

The ideal coccidiostat should be tested for activity against as many of the species as possible. Until now most drugs have not been tested against more than two species of chicken coccidia.

Coccidiostatic drugs are now such a common ingredient of the feed bag that no sizeable mill can avoid using one or more of them. Because of "plus factors" and the wide variety of conditions in the field, a drug should be tested in widely distributed geographic areas. To determine the drug of choice requires more intensive testing than ever before and points to the need for critical examination of testing procedures.

FEEDING BORON TO CONTROL FLIES—J. G. Goodman, API: Polybor-3 fed in small quantities to laying hens will greatly reduce fly development in manure under cages.

Boron added to feed and consumed by hens increases the boron found in eggs and body tissues.

The addition of 1 to 2 oz. of Polybor-3 per 100 lb. ration will control flies in cage houses and will not

NEW IDAHO FEED MILL—A new feed mill in Nampa, Idaho, has opened under the name of Albertson Feed & Milling Co. with Kenneth E. Bratney in charge. The plant will produce about 190 tons of poultry feed daily. Most of the feed produced by the mill will go to the Albertson Brooder Farm near Nampa. Vacuum operation will take the grain from farmers' trucks and move it to a receiving area. The process will handle about 15 tons of grain an hour, according to Don Thayer, construction foreman.

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PROVIDES
High Quality Protein with a Full Complement of Amino Acids
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Unidentified Growth and Unique FLUS Factors
Natural Anti-Oxidant Properties

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In milk replacement formulas, breeder rations and other feeds for swine, cattle and calves, Brewer's Dried Yeast acts as a growth stimulant, accelerates the rate of gain, improves the utilization of other nutrients and provides the "extras" in time of stress.

In poultry feeds Brewer's Dried Yeast improves hatchability and viability, stimulates growth, prevents enlarged hocks in turkeys and certain types of leg weakness in ducks and geese.

In specialty feeds for dogs, cats, mink, fish and bees the incorporation of Brewer's Dried Yeast avoids the risk of nutritional deficiencies, promotes proper metabolism, adds appetite appeal and protects against certain types of infections.

The natural anti-oxidant properties of Brewer's Dried Yeast guard the purity, freshness and palatability of flavor-and-oxidation-sensitive feeds and prevent or retard the development of harmful rancidity and thus prolong storage stability. They also protect oxidation-prone vitamins.

The unique properties of Brewer's Dried Yeast are partly inherent in the strain—Saccharomyces cerevisiae—a "perfect" yeast, and partly due to its matchless growth medium and conditions of fermentation. Because of its high nutritive value, versatility and stability, genuine Brewer's Dried Yeast is favored as a rich source of natural B vitamins and unidentified factors in all types of feed. The tradition of research and experience provides conclusive evidence that it represents a notable ingredient for modern feed formulation. No other yeast expresses so well your insistence on unyielding standards of perfection.

Investigate the advantages of Brewer's Dried Yeast

WRITE FOR COMPLETE INFORMATION TO

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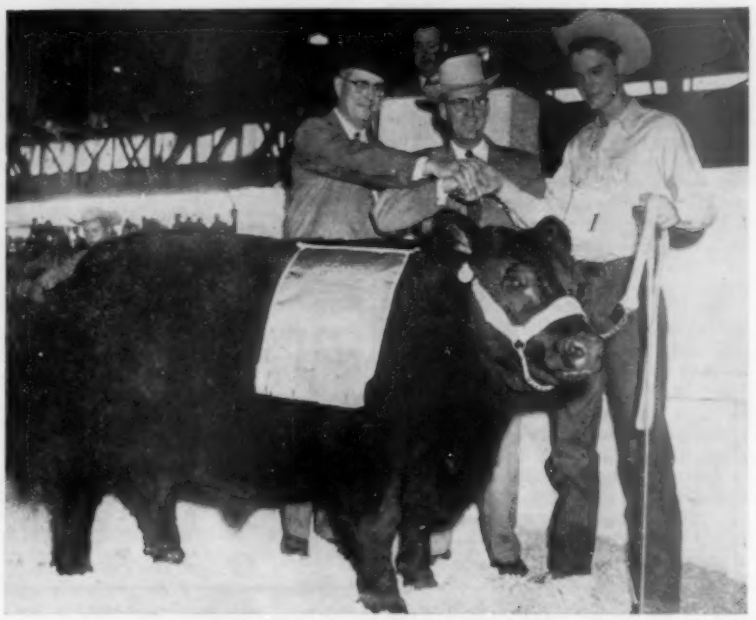

CHAMPION CALF—Bill Holcomb (right), Seminole, Texas, shakes hands with Burrus Feed Mills executives, Charles Harris and Wesley Ballmann (left and center) as they take a look at Bill's calf. The 1,030-lb. animal took top honors at the Texas State Fair Junior Steer Show. The Burrus Feed Mills, Ft. Worth, paid Bill a record-breaking $3.07 lb. for the calf. Following the purchase the calf was presented jointly to the Texas Association of Future Farmers of America and the Texas State 4-H Club Council.

greatly increase boron content of eggs produced.

The addition of 4 oz. of Polybor-3 per 100 lb. ration will reduce egg production and show signs of toxicity. No harmful effects to fertility and hatchability of eggs from hens fed this ration for 14 weeks were noted. Hatchability was reduced when this level was fed for 22 weeks.

The Pure Food and Drug Administration must give permission before this product can be mixed in the poultry ration.

HIGH VITAMIN RATIONS FOR DISEASED BROILERS—George R. Ingram and Ellis O. Cross, API: A series of experiments has been conducted with broiler chicks to determine the effect of a ration containing five times the normal levels of vitamins upon growth rate when the birds were infected with CRD, coccidiosis or fowl pox.

In floor flocks of 80 to 90 birds each, three tests have been completed using 10 pens on the high vitamin ration and 10 pens on the regular level of vitamins. All birds were given sporulated oocysts of E. tenella or E. necatrix. In two of the three tests, there was a slight weight ad-

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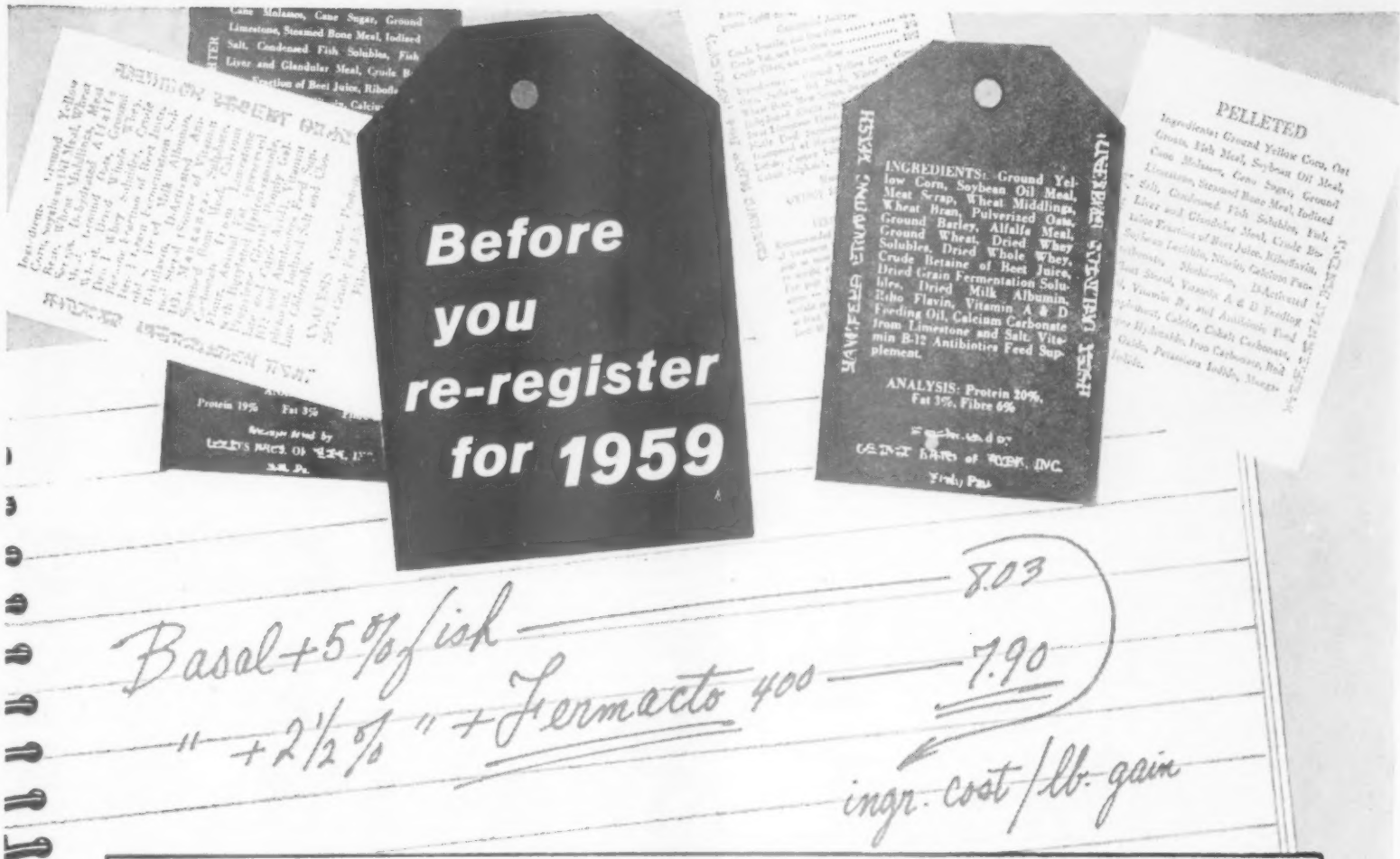
Before you re-register for 1959
INGREDIENTS: Ground Yellow Corn, Soybean Oil Meal, Meat Scrap, Wheat Middlings, Wheat Bran, Pulverized Oats, Ground Barley, Alfalfa Meal, Ground Wheat, Dried Whey Solubles, Dried Whole Whey, Crude Betaine of Beet Juice, Dried Grain Fermentation Solubles, Dried Milk Albumin, Riboflavin, Vitamin A & D Feeding Oil, Calcium Carbonate from Limestone and Salt, Vitamin B-12 Antibiotics Feed Supplement.
ANALYSIS: Protein 20%, Fat 3%, Fibre 6%
PELLETED
Basal + 5% fish — 8.03
" + 2½% " + Fermacto 400 — 7.90
ingr. cost/lb. gain

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BORDEN *Feed Supplements...*
to cut your costs without sacrificing performance

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MG 2X 400	economical new blend of concentrated whey and fermentation factors
MG 2X-AP	all-purpose poultry feed supplement providing MG 2X 400 plus extra fish factor and essential micronutrients
OMNI-MIX	complete whey-fish-fermentation mix plus micronutrients, for economy plus quality in poultry feeds
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also — supplements for hog, cattle, and small animal feeds, providing varying necessary levels of unidentified growth factors, antibiotics, and other micronutrients

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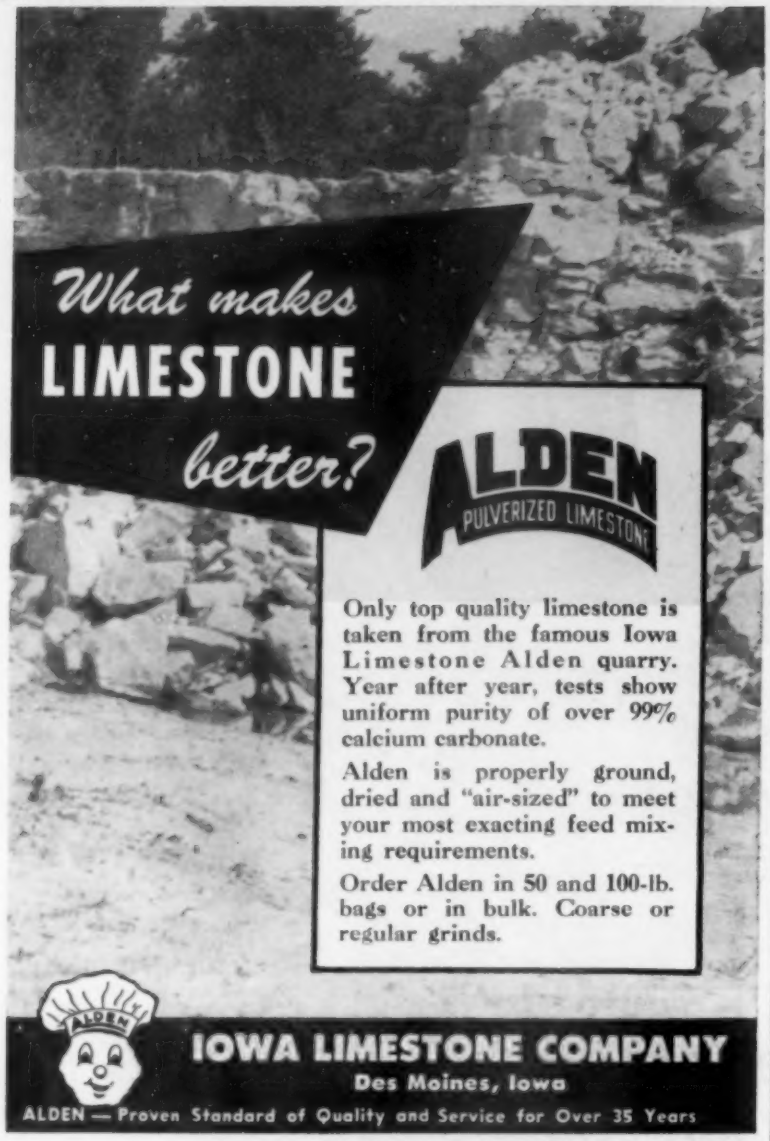
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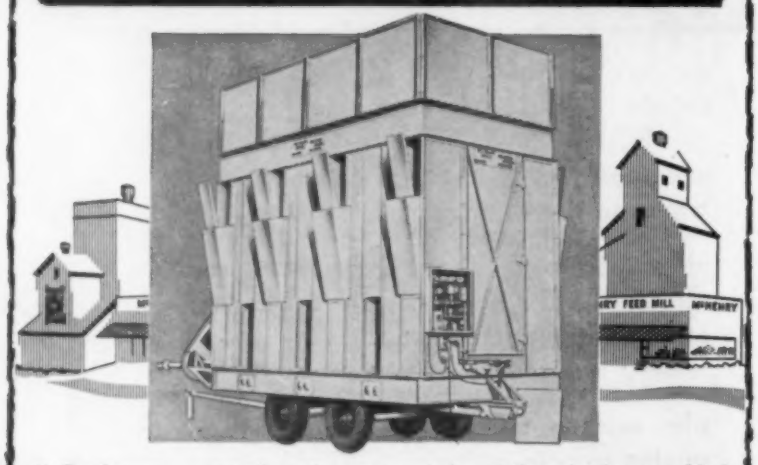


• Continuous . . . goes in wet; comes out dry. • Completely assembled Grain Dryer. • Portable, requires very little installation expense. • Strong! Holds 20 tons of grain. • Capacity up to 268 bu. per hour. • 15 H.P. electric motor. • LP or natural gas. • Quiet for "in town" use. • Minneapolis-Honeywell temp. and safety controls. • Can't plug, grind or crack grain. • Dries all grains, beans and rice. • Can be put in operation for less than ½ the cost of other continuous dryers of same capacity. • Serviced by National Distributing Organization.

Makes grain drying easier than ever! No batches; just simple, continuous drying. An M-C Grain Dryer at your elevator will do a better job of quality drying. Here's a grain dryer that *really* improves grain quality with no heat damage—no kernel checks or cracks. These are some of the features only available in the M-C Grain Dryer.

MATHEWS COMPANY
CRYSTAL LAKE, ILLINOIS

vantage in favor of the high-vitamin ration. Feed conversion was improved also.

In battery tests, rations with three different vitamin levels were tested against birds infected with fowl pox vaccine. Although weight gains were very poor, there was marked response to both high vitamin rations.

A series of field tests was conducted with commercial broilers in houses known to have a history of CRD. In those houses where only mild symptoms of CRD were observed, a slight advantage in weight gain and feed conversion was obtained on the high-vitamin ration. When severe cases of CRD developed, no differences were observed.

CURRENT INVESTIGATIONS IN SWINE NUTRITION—H. F. Tucker, API: Swine production is fast developing along more scientific lines of nutrition, management and housing. Research has shown that swine, when confined to concrete floored pens, can be raised economically from birth to market. This will offer new opportunities for many Alabama swine producers.

It is conceivable that the swine industry could develop along lines similar in many respects to the huge poultry industry of Alabama.

NEW IDEAS FOR SWINE FEEDING IN THE FUTURE—T. J. Cunha, University of Florida: Unless the swine industry increases the quality of its product and puts up a fight for its share of the housewife's food dollar, per capita pork consumption will continue to decrease as it has done in the last ten years.

The swine industry is arriving at a point where farmers will no longer be able to postpone their decisions to use the latest practical and more economical practices being discovered by the research worker in all phases of this industry. The one who disregards these new findings will be squeezed out by the specialized and intensified swine industry of the future.

The swine industry is in the beginning stages of more specialization. A well-balanced feed will not do the job unless it is fed in adequate amounts. Too many farmers who buy carefully balanced supplements or complete feeds fail to feed enough to their pigs. As a result, the pigs are still short of needed proteins, minerals, vitamins and other nutrients.

Some advances in the swine industry are that the trend is toward earlier weaning of pigs. Many swine producers are already weaning their pigs at 6 weeks instead of the customary 8 weeks through the use of high quality starter feeds. This should be practiced only to the extent that an economic advantage is realized.

Also, there is an increase in the use of pig parlors for fattening pigs. Disposal of manure and a source of good quality feeder pigs are two problems that confront the pig parlor operator. Better rations will need to be fed in pig parlors than on pastures, and when pigs are fed on concrete, high quality, well-balanced rations are a must. Pasture will still continue to be used for sows for reproduction. More silage, properly balanced, however, will be used for sows during gestation in the future.

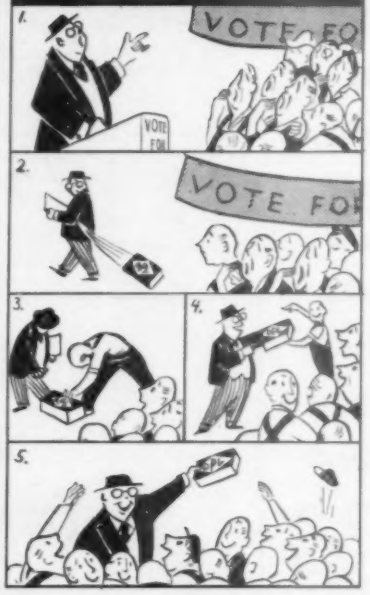
CATTLE NUTRITION TRENDS—J. L. Williamson, Ralston Purina Co.: Outstanding developments in poultry and swine nutrition during the past 10 or 15 years have resulted from intense research, and from the relatively fast "turnover" rate of chick, broiler and swine experiments. Beef research has, unfortunately, advanced at a much slower pace to date. Both the length of time necessary to complete cattle experiments, and the difficulties involved in doing exact, fundamental cattle research have hampered progress. These factors have been largely responsible for the great number of "feedlot" experiments and the paucity of well-controlled fundamental nutritional experiments. We need sound, basic knowledge before we can make rapid progress in applied or feedlot research.

Variable results have been reported on creep feeding calves. The relative prices of creep feed mixtures and cattle have been of major importance in measuring the value of following such a program. The expected average increase in gain from creep feeding is quoted by Oklahoma workers to be approximately 60 lb. per calf. Kansas workers have reported heavier calves at weaning and faster, more efficient gains from birth to market when calves were creep fed.

Our results with creep feeding agree in general with other published work showing that creep feeding produces a heavier, higher grading calf at weaning plus better cow condition.

Our research has shown that the increased gain on the calves will pay for creep feeding, and we have the added advantages of better cow condition and a higher selling price per pound for the calves. We are seeing more and more creep feeding every

DPL wins poultrymen's vote!



Of course poultrymen get interested in a candidate who shares their problems and who is smart enough to solve them with DPL vaccines! DPL wins an ever increasing number of individual poultrymen's elections by providing that unique combination: the right vaccine and the right vaccination method for every situation. May we help you find the right DPL combinations for your operation? Fill in the questionnaire and take advantage of this free DPL service today.

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year. The trend seems to be toward a lighter carcass that is well finished and tender. Creep feeding makes this type of carcass possible.

Creep feeding has usually been profitable when calves were kept on high-energy rations after weaning. Feeding cattle on grass has been shown to be profitable, especially during periods of dry weather or when pastures begin to deteriorate in quality. Grass silage may equal or excel corn silage in producing cattle gains, if the silages are measured on an equal basis.

Corn cobs, oat hulls, or barley hulls may be used as satisfactory sole sources of roughage for fattening cattle if supplemented properly.

It appears possible that considerable improvement in gains and feed efficiency may be obtained when protein supplements rather than legume hays are used to supplement fattening cattle rations.

Tapazole and tranquilizers may increase rate and efficiency of cattle gains, but more data will have to be compiled before firm conclusions can be reached.

Pelleted complete rations for beef cattle have generally produced more efficient gains than meal rations. The rate of gain on fattening rations, however, has been reported to be equal or lower than gains on comparable meal rations. Before pelleted rations can be conscientiously recommended, several factors such as type of ration, distance from a pellet mill and method of feeding must be carefully considered.

EXTENSION HOG MARKETING PROGRAM—Ray Cavender, Extension Service, API: In 1957, for the first time in the history of Alabama agriculture, income from the sale of livestock exceeded income from row crops. From all indications, more and more of the future economy of Alabama agriculture lies in the production of meat animals. Alabama is producing only about 2% of the nation's pork. We could double our production and it would not affect our hog markets.

Realizing the existing problems and anticipating future needs, let me mention a few of our activities: (1) Promoting meat-type hog production through county extension staffs. We are offering purebred hog breeders a system of on-farm testing. (2) We are working with markets and packers to establish a system of merit-buying or buying on a graded basis. (3) We are promoting the consumption of pork as well as other meat products. (4) We offer our services and help to the frozen food locker industry, packing industry, meat processors and others.

EXTENSION PROGRAMS AND FEED RECOMMENDATIONS FOR MILKING COWS—John R. Parrish and R. Sam Jones, Jr., API: Extension dairying activities may be covered under the following headings: (1) 4-H; (2) herd management, including breeding, calf raising, feeding, disease control, and marketing; (3) organized testing; (4) organizations; (5) special problems and programs.

In 1957, dairying ranked fifth as an agricultural enterprise in Alabama. This rating was based on sales of milk and milk products alone—sales last year amounted to over $35 million.

Dairying in Alabama has followed the national trend since 1954—that is, less cows and more milk per cow.

Many problems have been encountered in development of the industry here. Perhaps the greatest are low-producing cows and a poor roughage program.

One of the programs that has helped raise the production of cows is artificial breeding, started in this state in 1946. Last year, over 20,000 cows were bred in this program, and we estimate that more than 40,000 will be bred this year.

In 1948, a unified cooperative testing program was organized on a state basis. The 18,951 dairy cows in Alabama on a production testing program represent 5.5% of the cows in milk in Alabama. In January, 1959, a state wide campaign will be conducted in an effort to get more cows on a production testing program. The increase from 4,756 to 6,754 lb. milk per cow represents a 42% increase in milk production in eight years, and the increase from 219 to 281 lb. fat is a 28% increase. During the same period, all Alabama dairymen have increased milk production only 7% and butterfat only 3%.

EXTENSION'S POULTRY PROGRAM—S. L. Davis, API: Sale of poultry and poultry products amount-

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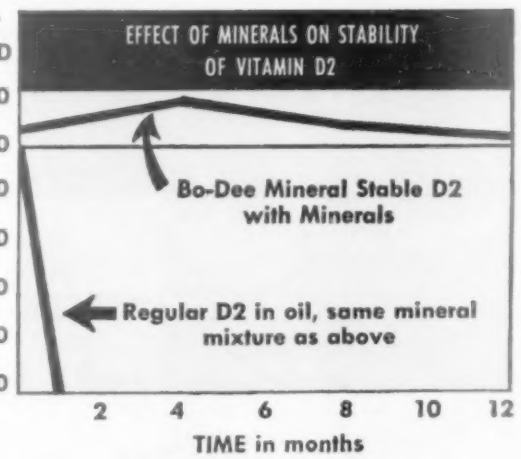

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SPEAKERS AT ARIZONA CONVENTION—Speakers at the recent annual convention of the Arizona Grain & Seed Assn. in Phoenix were Earl C. Corey (left), director, Commodity Stabilization Service, Portland, Ore., and Sen. Barry Goldwater (R., Ariz.) in the second picture. In the third photo is Sen. Carl Hayden (D., Ariz.), an honored guest of the convention, visiting with Allen L. Rosenberg, Advance Seed & Grain Co., Phoenix, a past president of the association.

ed to $84,626,000 in Alabama in 1957. There were 103,875,000 broilers produced and sold for $59,832,000 by an estimated 4,275 growers. Egg sales amounted to $22,990,000 from an estimated 3,530 commercial producers.

Alabama ranks third in the nation in broiler chick placements this year. We have led all states in the percent increase of broiler chick placements this year over 1957, with about a 30% increase. Alabama is also the only southern state to show an increase in egg production over last year, with a 6% increase up to the present time. Five southern states are ahead of Alabama in egg production. They are Texas, North Carolina, Georgia, Kentucky and Tennessee.

A further illustration of the value of poultry to those in the feed industry is this fact: 74% of the feed handled in Alabama was classified as poultry feed in the last report from the Department of Agriculture.

Each county extension unit is responsible for planning and developing a poultry program suited to the needs of that county.

EXTENSION SERVICE PROGRAM IN BEEF CATTLE—W. H. Gregory, API: In 1940, the income of Alabama farmers from the sale of cattle and calves was about $6 million. Last year it was eleven times as big, or $66 million, and this year will be much larger due to price increases of about 20%.

There are only 12 states with more brood cows than has Alabama, and there is no area in the U.S. with as many brood cows per square mile as has the Black Belt.

The beef cattle industry in Alabama can be divided into three parts: The commercial cow herd business, the purebred business and the steer business. Our county agents reported that there are 28,599 Alabama farmers in the commercial brood cow business, owning 878,000 brood cows.

Several years ago we devised what we call the Alabama Ten-Point Program which, if carried out, we believe will make a herd of brood cows show maximum profit. This program is as follows: (1) Produce year-round grazing and stored feed for winter. (2) Control breeding to secure fall calves. (3) Use big-type bulls instead of pony-type bulls. (4) Use a bull of a different breed to get hybrid vigor. (5) Save best heifers for herd building. (6) Creep-feed calves for heavier, firmer beef. (7) Sell before market breaks in fall. (8) Cull poor milkers and slow breeders. (9) Control parasites and diseases. (10) Control predators and cattle rustlers.

SHEEP PRODUCTION IN ALABAMA—Robert C. Farquhar, API: Sheep numbers in the U.S. have continually decreased from their high of 50 million in 1885 to their present number of 27,390,000 head. The Alabama picture is similar. As of this past January, Alabama is listed as having 77,000 head of sheep representing an $800,000 income.

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Feed Firm Sponsors Clinic for Poultrymen

AUGUSTA, MAINE — Dr. L. D. Matterson, poultry scientist at the University of Connecticut, was the featured speaker of the Lipman poultry clinic, sponsored here by Samuel Lipman Sons for Maine poultrymen.

Joining Dr. Matterson as speakers were Dr. Jerry Roundtree, a member of the Lipman research staff, and Dr. Fred Moultrie, Arbor Acre Farms, Glastonbury, Conn. The clinic had a turnout of approximately 100 persons.

Dr. Matterson said controlled high efficiency feed for heavy laying hens can save the poultryman $1 per hen yearly. Dr. Roundtree spoke on early identification of respiratory diseases, and Dr. Moultrie discussed breeding as a key to hatching problems.

By controlled feeding, Dr. Matterson said he means feeding a predetermined quantity of feed necessary only for body maintenance and production during the hours of 8 a.m. to 3 p.m. and then leaving the hoppers empty.

The high efficiency ration cannot be fed freely except for the first four weeks in the laying pens or until maximum production of eggs. After that time, full feeding causes high mortality, he said.

New Feed Plant Opens in Georgia

SYCAMORE, GA.—The Sycamore Milling Co. has been established here for the manufacture of poultry and livestock feeds. The owner is J. K. Nelson, a peanut buyer in Georgia for 24 years and in the feed business for the past two years.

The plant uses locally-grown grain mixed with protein concentrates.

The mill is mixing feeds on a custom basis, and also is making mixed feed, which includes concentrate formulas for those who wish to buy their products already made.

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OFFICERS—New officers of the Virginia State Poultry Federation, elected at the recent 28th annual convention of the group at Natural Bridge, Va., are (left to right): Elmer T. Clay, Clay's Hatchery, Blackstone, Va., vice president; J. W. Moyers, Beacon Milling Co., Broadway, Va., president, and George Heitz, Rockingham Poultry Marketing Co-op, Broadway, secretary-treasurer.

Virginia Poultry Federation Holds 28th Annual Convention; Elects New Officers

NATURAL BRIDGE, VA. — About 400 representatives of the poultry industry registered for the Virginia State Poultry Federation's 28th annual convention at Natural Bridge recently.

The group elected James W. Moyers, Broadway, Va., as the new president; Elmer T. Clay, Blackstone, Va., as vice president, and George A. Heitz, Broadway, secretary-treasurer.

Newly-elected directors are: Dr. C. E. Howes, head of the poultry husbandry department at Virginia Polytechnic Institute; Homer A. Long, New Market, Va.; G. H. Plageman, Richmond, Va.; R. T. Jones, Charlottesville, Va.; James Hill, Norfolk, Va.; Dan Birchett, Petersburg, Va.; John D. Shaffer, Maurertown, Va.; Max B. Wine, Harrisonburg, Va., ex-officio director representing the Feed Sales Improvement Assn.; Sterling Carter, Charlottesville, and R. J. Krueger, Roanoke, Va.

Other directors re-elected were: G. Don Whitmore, Harrisonburg; J. H. Meek, Richmond; John S. Hill, Culpeper, Va.; R. S. Wells, Richmond; C. W. Wampler, Sr., Honorary, and W. M. Heatwole, Harrisonburg, ex-officio, retiring president.

The two-day program included a panel discussion of the "pros" and "cons" of poultry as a credit risk by a panel of agricultural banking authorities from the Southeast.

Moderated by Dr. Paul Sanders, editor of the Southern Planter, the panel arrived at the consensus that poultry is achieving an increasing degree of stability as a loan risk. Conditions required of other industries for establishment of credit must be met, the panel generally agreed, but an improved position in competition for risk capital is the outlook for the industry.

Preceding the panel presentation, Mays Montgomery, Tilmont Egg Co., Athens, Ala., talked about management practices in broiler hatching flocks. Besides management practices, he said a successful broiler hatching operation requires a reliable market for the broiler as an end product, a genuine enjoyment of the business, and strong financing.

Another speaker, W. M. Gaunt, Jr., managing director of the Virginia Chain Store Council, said consistent high quality and year-round availability of eggs are necessary to promote growth of that industry by shaping favorable customer buying habits.

Speaking of the future of eggs, Mr. Gaunt called for further economies in production, processing and marketing of eggs as a means of successfully competing with other foods.

Turkey growers at the meeting were told that the state must produce a market as well as a product, since turkey is a crop of abundance. Alec Gordeuk, former editor of Turkey World, and now a turkey sales executive for Nicholas Turkey Breeding Farms at Sonoma, Cal., said this calls for a team effort in Virginia's turkey industry, coupling production interests with those of marketing.

Mr. Gordeuk foresees a potential turkey crop of 100 million by 1960. He said this will mean (1) an era of big turkey breeders and disappearance of little breeders, (2) greater emphasis on production methods and more confinement growing of turkeys, and (3) more integration of industry segments such as growing, processing, marketing, etc.

Turkey Trends

Trends predicted by Mr. Gordeuk included (1) growing interests in fryer-roaster size turkeys, with larger white breeds being marketed young; (2) all-in-one rations for more efficient feeding and nutrition control; (3) further inroads into competitive food consumption; (4) greater emphasis on uniformity over breast width; (5) year-round production, and (6) continuing growth in the Southeast turkey industry.

C. G. Bowes, marketing consultant for the National Broiler Council, said the solution for record-crashing production and fatter retailer profits is in the hands of the grocer. He called for more plentiful, prominent displays of chicken in stores.

Giving an address as the retiring president, Mr. Heatwole urged continuing and growing support for Virginia's poultry expansion program launched early this year. He said the ebb tide of Virginia's receding position in the nation's poultry picture is changing.

He called attention to the state's slip from second to ninth in national broiler production ranking, and a 2% decrease in production last year while states in the Deep South rose as high as 27%.

Award Presentations

At the federation's annual awards banquet, adult awards for distinguished service to the Virginia poultry industry and its federation went

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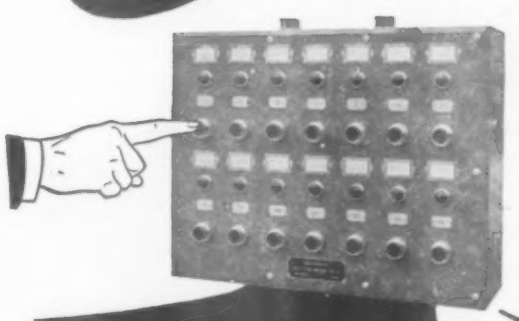

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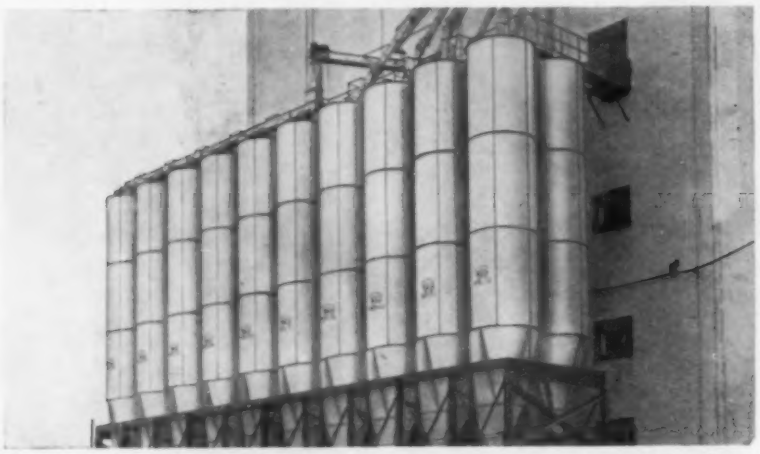
BULK STORAGE NEWS



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to Frank Frazier, Richmond, executive secretary of the National Broiler Council; Hollis Shomo, assistant director of the Virginia division of markets, and Elmer Clay, Blackstone, hatcheryman. Another award went to Hershey Weaver, retired Harrisonburg poultry processor and egg industryman.

Mr. Frazier's award recognized service to the industry as federation executive secretary from 1946 until three years ago when he planned and organized a national consumer promotion agency for broilers. Mr. Shomo's award recognized his service with the federation. Among his achievements, he helped plan and organize the National Poultry Improvement Plan which was instrumental in combating pullorum disease.

Rated as top Virginia 4-H and Future Farmers of America members in poultry work were Benjamin Hawkes, Henry County 4-H member, and Bruce Cauthorne, Hanover County FFA youth.

University of Arizona Opens Dairy Center

TUCSON—The new dairy science research center of the University of Arizona was dedicated Oct. 25 here. The main speaker was Dr. D. R. Theophilus, president of the University of Idaho.

The new dairy center is located near the junction of Campbell Ave. and Prince Road in Tucson. It consists of corrals for cattle, a modern milking parlor, laboratories and research facilities, and offices for researchers and students.

The center is to be used for dairy research, both applied and basic, and for demonstrations and instruction.

CATCHES SAILFISH — Posing proudly beside the 10-ft., 110-lb. sailfish he caught is Fred L. Gaines, Shellbuilder Co., Houston. He hooked the fish about 11 miles off of Acapulco, Mexico, and it took about half an hour to land the big one. Mr. Gaines and his wife spent several days in Acapulco following the recent World Poultry Congress which was held in Mexico City. Others associated with the feed industry who were there included Mr. and Mrs. Floyd Gee, Butler Chemical Co., Houston; Mr. and Mrs. Charles L. Davidson, Jr., Stone Mountain Grit Co., Lithonia, Ga., and Dr. and Mrs. J. Russell Couch, Texas A&M College.

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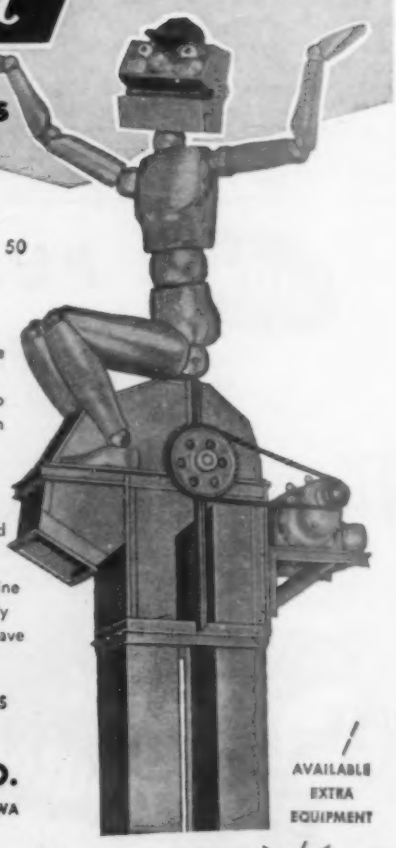

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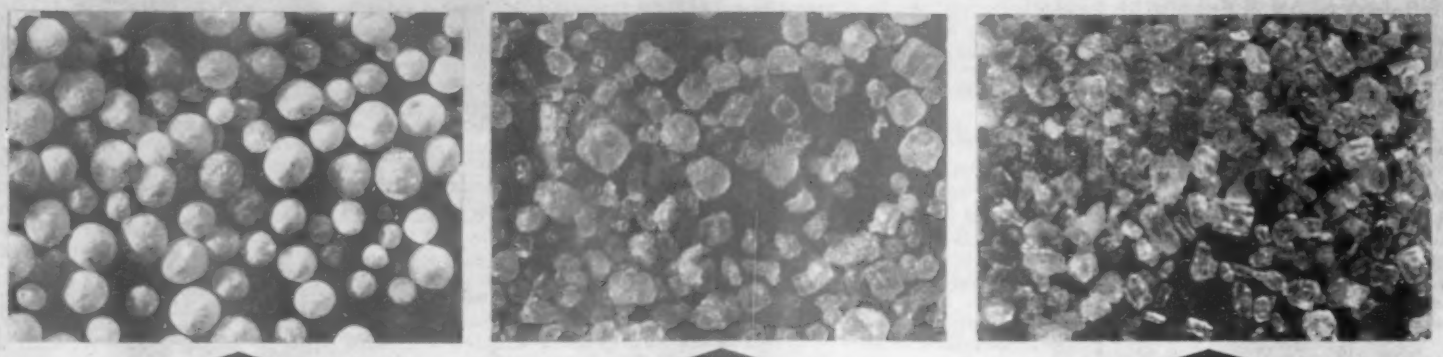

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2 Million Eggs Handled Daily At PPCC Processing Plant

By Special Correspondent

SAN LEANDRO, CAL.—Eggs never had it so good. That's the story at the egg grading and distribution plant of the Poultry Producers of Central California at San Leandro.

The 10,700-member egg marketing and feed supply cooperative recently held an open house at the new plant for about 300 representatives of the grocery trades, agricultural, business, civic and education groups.

One day's egg output from the plant is the production of 3 million hens, which have consumed 500 tons of feed, according to Frank Melchior, manager of member relations for the cooperative.

The new plant is a marvel of electrical and mechanical efficiency. Construction of the low, modern plant building began in September, 1956, and was completed a year later. Final consolidation of the operation came last June. Eggs are graded and packed at the new structure in the same volume formerly handled by eight other plants.

Covers Five Acres

Situated on a 15-acre site, the steel-and-concrete building itself covers nearly five acres, and, with its modern equipment, represents an investment of approximately $2,800,000.

Two million eggs per day can be processed in the plant after being brought in from the country by 14 large refrigerated vans owned by the farmer-owned cooperative. The cases of freshly-laid eggs are electronically handled by an unloading carriage that moves along the dock on rails, enabling it to service all truck-unloading stations. It fits into the vans themselves, and carries entire loads directly into the plant "incoming" cooler without the aid of human hands.

The incoming pallets are conveyed along a system of rollers to a station where forklifts pick them up and truck them to the candling areas. Two eight-hour shifts employing 108 girls handle the 54 candling stations in the plant. There are nine candling machines with six girls working at each machine. The modern equipment in the operation has doubled the candling capacity in the process, with each girl now able to turn out about 70 cases of eggs per day.

Automation again comes into play when the eggs leave the candling machines. They travel in a conveyor, slotted for the individual eggs, and are electronically dropped into cartons placed beneath the conveyor. This electronic selection system puts the graded egg into its proper carton.

During the entire candling, sorting and packaging operations, little overhead illumination is provided in the plant, but excellent lighting conditions are available above the working tables and conveyors, allowing the staff to thoroughly check the eggs in these critical phases of the process.

The cartons are next closed and sent on another conveyor to tables where they are hand-packed into cases. Again, another section in the 12 miles of conveyors in the plant takes the cases through a sealing process to the refrigerated holding room where 24,000 cases may be stored to await shipment.

Filling Orders Electronically

Orders are electronically filled by an electronic selection console made by Food Machinery & Chemical Corp. The console allows the operator to pick the quantity and grade of particular orders simply by turning a switch on the control panel. Automatic order-picking conveyors respond to the console's impulse and ship the cases desired along another conveyor belt to the loading dock behind the holding room. There, the fleet of 62 refrigerated trucks pick up the cases and deliver them to the various outlets. The trucks are loaded by night shifts and are originally refrigerated by a large hose taking air from the plant's refrigeration system.

The refrigerated holding room covers more than 40,000 sq. ft. of floor space, and is held at 47 degrees and 80% humidity.

About 300 people are employed in the building, with 200 of those engaged in actual production work in the plant. A cafeteria is available for the workers, and a patio is located between the office and production sections of the building.

A railroad spur in the rear of the building facilitates the delivery of cardboard cases used for egg shipments. The packages of cases go directly from the boxcars to a 300-ft. conveyor belt making up the carton supply mezzanine in the plant. From the mezzanine, the cartons move on roller conveyors to the packing stations.

Rapid transportation, thorough refrigeration and automation make the plant one of the world's most efficient electro-mechanical egg grading and distribution facilities.

Mr. Melchior said it is possible that an egg laid early in the morning 100 miles away could be cartoned and ready for distribution by midnight on the same day.

Business Volume

The co-op, with 45 branches in northern and central California, reported a dollar volume of $49,478,000 in 1957. Of this total, $25,014,000 came from the egg department, $24,-

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Bulky Broadbottom says...
"The bigger bottom means higher capacity and lower center of gravity."

The 390 cubic foot capacity of a 10-foot long BULKMASTER is 30% greater than lower-priced bodies. From a profit standpoint, this means— 3 BULKMASTERS can deliver as much feed per day as 4 screw-conveyor units. This represents a saving of 25% on labor, truck fuel and maintenance! And the same capacity ratio applies whether you operate one unit or a fleet.

To step up profits, step up to DORSEY BULKMASTERS!

Other deluxe Bulkmaster features...

AUGER UNLOADING (as illustrated)

- **36-inch-wide belt-over-chain conveyor**—can't slip and automatically maintains alignment (also standard on air models)
- **Extra-big augers**—12" vertical auger and 9" horizontal and final discharge augers
- **Completely hydraulic system**—has four motors so speed of belt and augers can be regulated
- **Safer Unloading**—conveyor or augers automatically stop if foreign matter obstructs system
- **Sliding Hatch Covers** with foam rubber seals

AIR UNLOADING MODELS

- **Medium Pressure Air System**—guards against separation of ingredients and results in quieter operation
- **30" Rotary Air Lock Feeder** is engineered for fast, efficient operation
- **Controlled Unloading**—clutches on conveyor and air lock feeder permit independent operation when pit dumping
- **Hose Storage Compartment**—is completely enclosed
- **Sliding Hatch Covers** with foam rubber seals

See your Dorsey Bulkmaster Distributor or mail coupon

DORSEY TRAILERS / ELBA, ALABAMA

Dorsey Trailers • Elba, Alabama

Please send literature on the Dorsey BULKMASTER line as follows:

☐ Bulk Bodies ☐ Bulk Trailers
☐ Air Unloading ☐ Auger-type

NAME_____

COMPANY_____

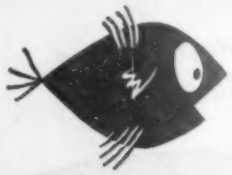
ADDRESS_____

CITY AND STATE_____

☐ Send name of nearest DORSEY BULKMASTER Distributor. F

WHAT!

Food Without a Hook?



FEEDSTUFFS

Offers a lot to its readers..no catch to it. $5 a year brings 52 issues crammed full of information.

EGG PLANT—This aerial view of the egg grading and distribution plant of the Poultry Producers of Central California in San Leandro, Cal., shows the extensive grounds with the large refrigerated plant building in the rear and the administrative offices in the front.

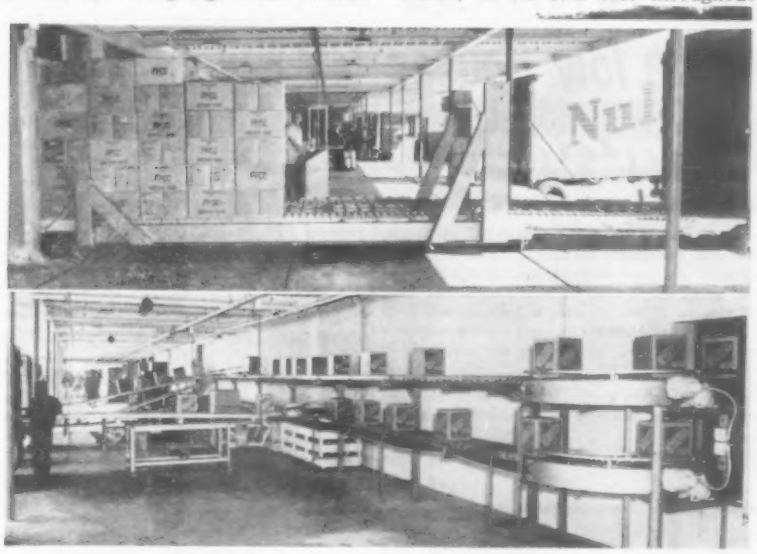
387,000 from the feed and supply department, and $77,000 from the poultry department.

According to the co-op annual report for 1957, feed patronage during the year amounted to 268,979 tons, including mixed poultry, dairy and livestock feeds, grains, seeds and other feed ingredients.

The report noted that among the major policy changes made during 1957 was one permitting the sale of feed and farm production supplies to non-members under a "special non-member patronage agreement" which extends such purchase right for an unstated period, subject to cancellation by the patron at any time, and by the association on a 15 days' written notice.

Feed Pricing Policy

Also mentioned in the report was the adoption of a modified bulk feed pricing policy, under which bulk feeds are invoiced to members on a mill-to-ranch basis. Pricing is supported by extended analytical studies placing each type of sale, bulk or sacked, on its own cost throughout



EGG HANDLING—An entire refrigerator van load of eggs—450 cases—can be unloaded in 4.5 min. with the aid of a completely electro-mechanical system utilizing roller conveyors at the new San Leandro, Cal., egg processing plant of the Poultry Producers of Central California, a large egg marketing and feed supply cooperative. In the bottom picture, Nulaids (brand name for PPCC eggs) are automatically loaded by mechanical equipment into truck vans for shipment to retailers.

Attention: FEED AND MINERAL MIXERS

Now get 3% more IODINE

at lower cost with

CAL-IODIN*

the new, stable, J. T. Baker CALCIUM IODATE especially processed to mix readily

ECONOMY — You save money because Cal-Iodin gives you the stability of Iodate *plus* 3% more contained iodine at less cost than Potassium Iodate. Cal-Iodin's chemical properties make it particularly suitable for feeds and mineral mixes.

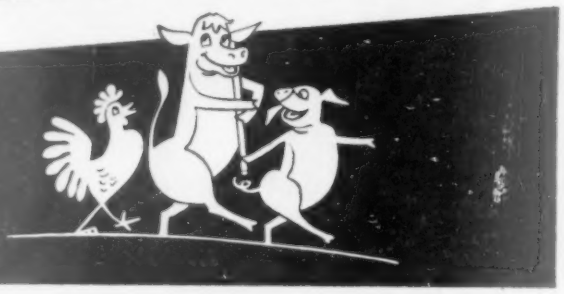
IMPROVED BLENDING — You save time because Cal-Iodin is especially processed to remain free-flowing and to mix readily with your other ingredients.

APPROVED — You can use Cal-Iodin with confidence because Calcium Iodate is officially recognized as a suitable ingredient of mineral feeds by the Association of American Feed Control Officials.

FOR INFORMATION, PRICES AND SAMPLES,
write or phone collect to J. T. BAKER CHEMICAL CO.:
IN THE EAST — 122 East 42nd Street, New York 17, N.Y. OXford 7-1640
IN THE WEST — 435 N. Michigan Ave., Chicago 11, Ill. SUPerior 7-9490

J. T. Baker also offers you an economical source of high quality Potassium Iodide, U.S.P. forms, Potassium Iodide, Calcium Stearate Purified 90-100% mixture and Potassium Iodate Purified Powder.

*Trademark Registration Pending



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EARL GARRATT—BOB KIVETT, ASSOCIATES
Phone BA 1-0337
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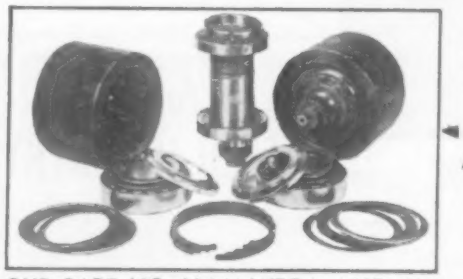
All Feed Ingredients
A Nationwide Service from the Heart of America

NEW DOUBLE-SEALED PELLET MILL ROLLER ASSEMBLIES

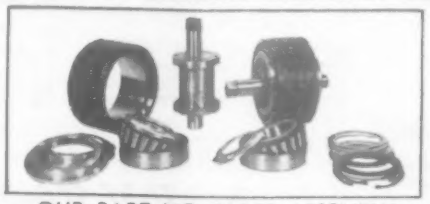


OUR PART NO. LM-66-WFGA ASSEMBLY

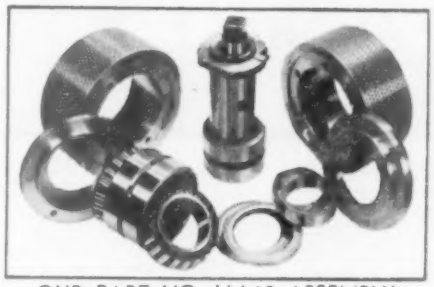
Replacement parts for California Century #931-WFGA. Dimple-faced rolls with snap-in seals and safety seals as shown.

Replacement parts for SPROUT-WALDRON "Pellet Ace" and "Simplex" No. 301 with standard grease seal (snap-in seals and safety seals available).

ALL PARTS MFD. BY LANDERS MILL MFG. CO.



OUR PART NO. LM-70 ASSEMBLY



OUR PART NO. LM-68 ASSEMBLY

▲ OUR PART NO. LM-67 ASSEMBLY

Replacement parts for SPROUT-WALDRON "Pellet Ace" and "Simplex."

New improved assembly using bearing adjusting nut and #742 cup—#749 cone, (bearing) with snap-in seals and safety seals.

Replacement parts for Universal AAA pellet mill.

Improved assembly using bearing adjusting nut with snap-in seals and safety seals.

SEE IT IN ACTION AT Midwest FEED PRODUCTION SCHOOL NOV. 12-14

LANDERS MILL MANUFACTURING COMPANY

LANDERS
MILL MANUFACTURING CO.
207 East Broadway - Fort Worth, Texas

We pay the freight on pellet mill dies to your plant

WRITE TODAY FOR PRICES AND CATALOGUE

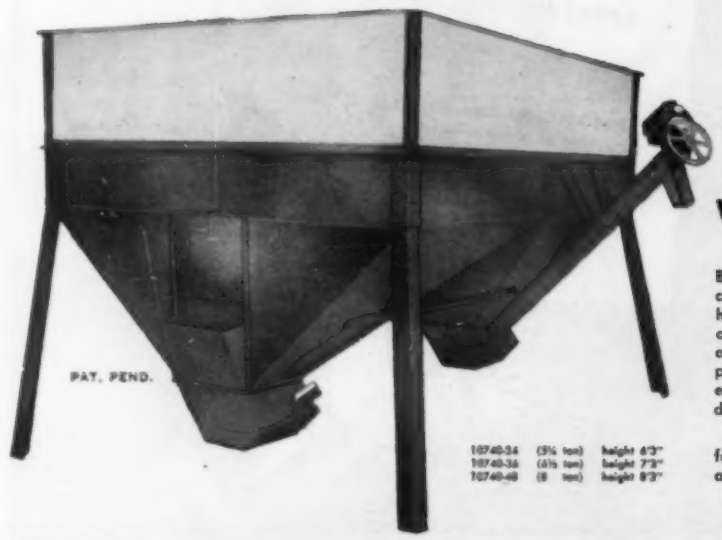
TYPE OF PELLET MILL USED_____
FIRM NAME_____
ADDRESS_____
CITY_____ STATE_____
SIGNED_____

NEW CO-OP FACILITIES—Poultry Producers of Central California, a large egg marketing and feed supply cooperative, recently held an open house to show the public its new electro-mechanical egg processing plant at San Leandro, Cal. The co-op's San Leandro general office and headquarters building is shown in the first picture. At the egg candling stations (second picture) in the new egg processing plant each girl is able to inspect 18,000-25,000 eggs a day with the help of electro-mechanical machinery which automatically weighs and packages.

manufacturing, sales and delivery operations. "The change recognized our rapidly increasing bulk feed business and the necessity for preservation of the principle of equitable treatment of bulk and sacked feed users so that all share in the pricing structure in direct relation to the cost of the service to them," the annual report stated. "By the close of the year, 46.8% of our total feed tonnage was bulk, an increase of 63% over 1956."

The co-op's eggs are marketed under the brand name, Nulaids.

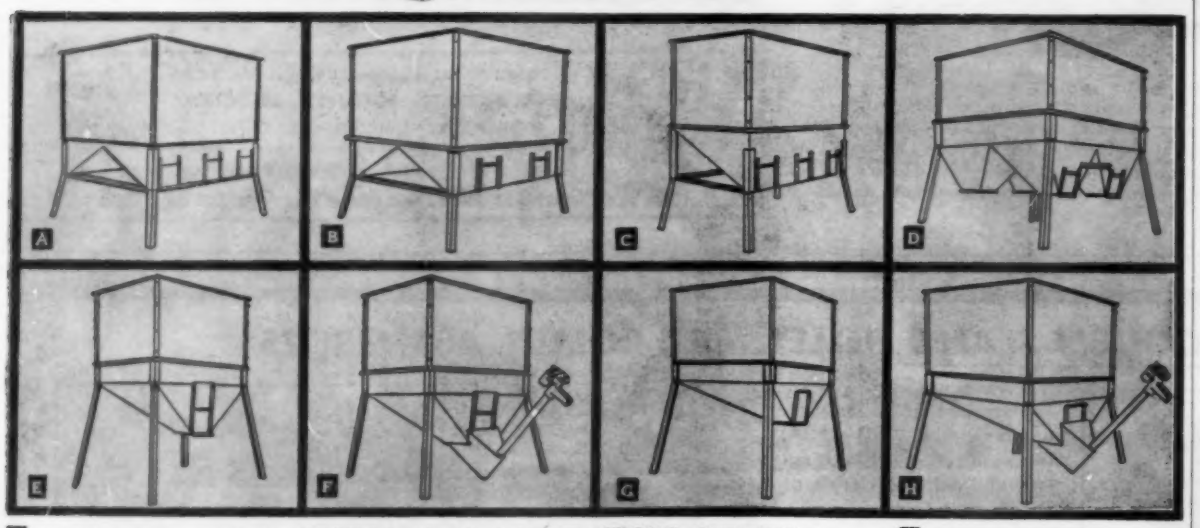
NOW YOU CAN BULK FEED HIGH TONNAGE inside low houses with Lemanco



Because of the trend in the poultry industry to larger capacity houses and mechanical feeding, Lemanco engineers have designed a bin to give inside storage up to eight tons of feed even in areas where head room is limited. The base of this 10740 bin, as shown at left, is built in two compartments. When one compartment is emptied, the auger is easily switched to the other. Two augers are available if desired.

10740-34	(3½ ton)	height 6'3"
10740-36	(4½ ton)	height 7'3"
10740-48	(5 ton)	height 8'3"

Shown below are other top quality Lemanco bulk feed bins for every feeding purpose. All bins are adaptable for air or auger delivery.



A 7618-48-6D 6 door (4 ton) height 7'0"
Three doors on side make for easy cleanout. Especially desirable for pullet and hen feeding.

B 7618-48-4D 4 door (4 ton) height 7'0"
8618-42 4 door (3 ton) height 6'6"
Regular all-purpose 4-door bulk feed bin.

C 7424-42 (2½ ton) height 7'2"
5424-24 (1½ ton) height 5'6"
Designed for placing against wall or in corners where large capacity not required.

D 7736-36 (4 ton) height 7'6"
Side doors and bottom draw gates permit complete emptying of any type feed including mash of high fat or high fiber content.

E 7540-36G (3½ ton) height 9'2"
7540-48G (4 ton) height 10'2"
Designed for over automatic feeder where head room is not a problem. If necessary to extend through roof, cover is available or plans furnished to build your own. These bins easily adapted for air delivery.

F 7540-36A (3½ ton) height 8'0"
7540-48A (4 ton) height 9'0"
The large access doors and the pitch of the base make these excellent bins for all feeds.

G 7636-36G (4 ton) height 8'6"
7636-48G (5 ton) height 9'6"
These models, (illustrated G and H), are designed for locations where head room is limited but large capacity required. Bins are recommended for pellets and crumbles. Due to shallower pitch they are not recommended for mash.

H 7636-36A (4 ton) height 7'0"
7636-48A (5 ton) height 8'0"

SAVE FEED WITH THE Lemanco FEED BARROW... and TUBE SCOOP

The Lemanco Feed Barrow, especially designed for the poultry industry, makes the feeding operation easier for any member of the family, young or old. Built of heavy gauge steel and chrome plated handles, it is so balanced that it cannot tip over and spill feed. Carrying capacity 165 pounds. Oilite bearings and dual or single semi-pneumatic wheels. Dual wheels recommended for areas where soft litter used.

Companion piece to the Lemanco Feed Barrow, the Feed Tube Scoop, 9" x 6", weight one pound, designed primarily for filling tube feeders without spillage. Vent holes in bottom permit filling and emptying of scoop without sloughing of feed.

LEACH MANUFACTURING COMPANY
GADSDEN, ALABAMA P. O. Box 1010 — Tel. Liberty 7-5472

Builds Egg Factory For Denver Area

DENVER — An "egg factory" to serve the Denver area is being built near Keenesburg, Colo., by the Columbine Poultry & Egg Farm. The newly incorporated firm is owned jointly by Mountain States Mixed Feed Co., a subsidiary of the Pepper Packing Co., Denver, and J. A. Sharoff & Co., wholesale poultry and egg firm.

The first laying house of 15 to be built on an 80-acre tract of the Columbine farm already is in operation as the first "solar" type egg production plant in the Rocky Mountain region, and it houses 7,000 selected hens that turn out eggs of controlled quality.

Plans call for 300,000 hens on "assembly line" schedule. The plant will be fully automatic. The new plant will provide Denver delivery within 24 hours of the time the eggs are laid, officials said. The houses will be heated by the sun.

Officials said that when the new plant is completed, it will rank next to California as the largest independent egg producing factory in the West. The solar type plant is said to be one of two of the type. The other is at Pennsylvania State College.

Eli Lilly Net Sales Show 9-Month Drop

INDIANAPOLIS, IND.—Estimated consolidated net sales for the first nine months of 1958 for Eli Lilly & Co. totaled $131,100,000. This compares with $151,600,000 for the same period last year, the difference being entirely accounted for by lower sales of poliomyelitis vaccine, the company reported.

Despite the decrease, this was the third-best nine-month sales record in the company's history.

Estimated consolidated net income after taxes for the period was $17,100,000, compared with $26,800,000 at the same time last year.

Earnings per share of common stock are estimated at $2.14. Last year's per-share earnings after nine months were $3.38.

Building Elevator

ARKANSAS CITY, KANSAS—Work started here Oct. 6 on a one million-bushel grain elevator at the Arkansas City Flour Mills plant of Dixie-Portland Flour Co.

The elevator is being built on to the west end of the present million-bushel structure, which was constructed about five years ago and will give the mill a total storage capacity of 2½ million bushels, according to Morris Wilkins, plant manager.

for the FEED INDUSTRY

- Chemical Analyses
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Write for Schedule of Charges

FEED SERVICE DIVISION
LIME CREST RESEARCH LABORATORY
R. D. 1, Box 87 Newton, New Jersey

LIMESTONE PRODUCTS CORP. OF AMERICA

Farm and Feed Salt NEWS

FROM INTERNATIONAL SALT COMPANY, INC.

Feed Manufacturers . . . it's up to you

. . . to Supply Poultry, Swine with Adequate Salt, Trace Minerals

Since poultry get no free-choice salt, and swine get very little, it's important for *feed manufacturers* to add the correct amounts of salt and trace minerals to poultry and swine feeds. The surest way to do this is to mix Sterling Gold Bond Blusalt in poultry feeds, and Sterling Swine Supermix Blusalt in swine feeds. Each of these salt products, properly mixed in your feed, assures the now known correct trace-mineral balance from mill to feed hopper. Your customers benefit from this—and you benefit from their satisfaction.

Sterling Gold Bond Blusalt contains extra manganese and zinc in the correct proportions to guard against leg weakness in chickens and turkeys. To counteract Parakeratosis in pigs, Sterling Swine Supermix Blusalt contains extra zinc in a readily available form. In addition to these manganese and zinc additions, both salt products also contain the now known correct amounts of iron, sulfate sulfur, copper, cobalt and iodine—blended with high-quality salt, the ideal natural carrier.

Guaranteed analyses, plus tables showing just how much Gold Bond or Swine Supermix Blusalt you should add to the many different types of poultry and swine feeds, are available from International Salt Company. Ask your Sterling representative, send a card to International Salt Company, Inc., Scranton 2, Pa., or contact our sales office nearest you.

SELL THESE PROFITABLE STERLING SALT PRODUCTS THROUGH RETAIL OUTLETS

With livestock soon going on spring pasture, the demand will increase for salt products to feed free choice. Retail feed stores can capitalize on this demand by stocking and selling these popular Sterling Farm Salt products.

STERLING BLUSALT: trace-mineral salt for free-choice feeding and for your custom grist mixes. Contains seven trace minerals needed for good growth and feed efficiency (manganese, iron, sulfate sulfur, copper, cobalt, iodine and zinc). In colorful bright-blue bags, 50-lb. blue blocks and 4-lb. blue Liks.

STERLING GREEN'SALT: trace-mineral salt plus 10% phenothiazine for effective low-level control of certain internal parasites. In attractive 25- and 100-lb. green and red bags—for free-choice feeding, feed mixing or to add on top of feeds.

STERLING GRANULATED SALT: pure, white salt for free-choice feeding or feed mixing. In 100-lb. bags. Also pressed into 50-lb. blocks and 4-lb. Liks.

? ? ? DID YOU KNOW ? ? ?

- Chickens can tolerate rather high levels of salt in feed. Even levels of eight per cent were found to be non-toxic over a short period of time. However, do not try to feed this level, since excessive water consumption will result in wet litter.
- The big spring push is on—to help retail outlets sell more Sterling Farm Salt products. Sterling ads give helpful hints on livestock management and production and on the proper use of salt for livestock feeding.

Want service with your salt?

You can get it from International Salt Company's Animal Nutrition Department. Located in Watkins Glen, New York, this department does continuing research into the proper use of salt and trace minerals in modern livestock and poultry feeding programs. This is *your department* to consult at any time for advice on your mixing or feed-formula problems, and for information on any of the Sterling Salt products.

INTERNATIONAL SALT CO., INC., SCRANTON, PA.

SALES OFFICES: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; Memphis, Tenn.; and Richmond, Va.

Service and research ... ore the extras in **STERLING SALT**

PRODUCT OF INTERNATIONAL SALT COMPANY, INC.

MEMBER AMERICAN FEED MANUFACTURERS ASSOCIATION

Formation of New England Egg Group Reported Progressing

DURHAM, N.H.—The formation of an organization to represent all egg producers in New England is progressing, according to Richard Warren of the University of New Hampshire.

Mr. Warren said that committees appointed by the state associations of Maine, New Hampshire, Vermont and Massachusetts have held five meetings since June and that many committees are studying special activities.

Also, he said, the Connecticut Poultry Assn. has recently appointed a committee to join with this group, and the Rhode Island association will soon take part. The group has tentatively chosen the name "New England Egg Producers Assn." and has tentative bylaws prepared.

The temporary chairman is Elliot Schubert, Methuen, Mass., and Mr. Warren is secretary.

"A number of contributions have been received to help with the organization work, indicating that there is considerable interest in such an organization," Mr. Warren said.

At a recent meeting at the University of New Hampshire, the following statement of purposes was adopted:

"1. To provide the medium for a united New England-wide attack on marketing and other problems of egg producers.

"2. To develop and promote a sound and effective quality and merchandising program for New England eggs, involving a New England seal or identification.

"3. To develop model marketing agreements and contracts between independent egg producers and egg handlers (private and cooperative) and to encourage the adoption of same.

"4. To encourage the merger of New England cooperatives into a strong, producer-controlled, marketing outlet.

"5. To promote the adoption of uniform egg laws in New England.

"6. To represent the egg producers of New England.

"7. To cooperate with other organizations in regional and natural programs of concern to egg producers."

Behlen Manufacturing Plans Plant Expansion

COLUMBUS, NEB. — Plans for a second major plant expansion this year for Behlen Manufacturing Co., Columbus, have been announced by the firm's president, Walter D. Behlen.

Construction will begin soon on a 157,500-sq. ft. plant which will be larger than the company's main plant, he said.

Behlen recently completed an 87,500-sq. ft. plant addition at Behlen, Neb., an industrial site near Columbus. The new plant also will be at this site.

The expansion program will increase production of all products which will allow the company to enter into a new program of mass production of new products and standard sizes of farm and commercial Behlen buildings which will be sold nationally, Mr. Behlen said.

The firm's building division has been producing custom-built grain storage buildings, elevators, farm buildings and other types of buildings.

The new plant will be in operation by spring. It will be the fourth major expansion by the Columbus firm in the last three years. The addition will give Behlen a total of nearly 400,000 sq. ft. of production space in addition to large outdoor storage areas, Mr. Behlen stated.

West Virginia Pulp Announces Changes

NEW ORLEANS — West Virginia Pulp & Paper Co. has named some of its personnel to new positions in the southern region of its multiwall bag division to handle growing sales and improve technical and customer service activities from Florida to California.

For the Atlanta district, Henry M. Howe has been named sales manager and Samuel O. Wilkes and Ernest E. Lockett as sales representatives, bringing Mr. Howe's sales staff up to three men.

Eugene O. Wilson has been added to the Dallas, Texas, district staff as a sales representative.

West Virginia has named Frank L. Smith district sales manager at Torrance, Cal. Mr. Smith was formerly district sales manager for the Southeast.

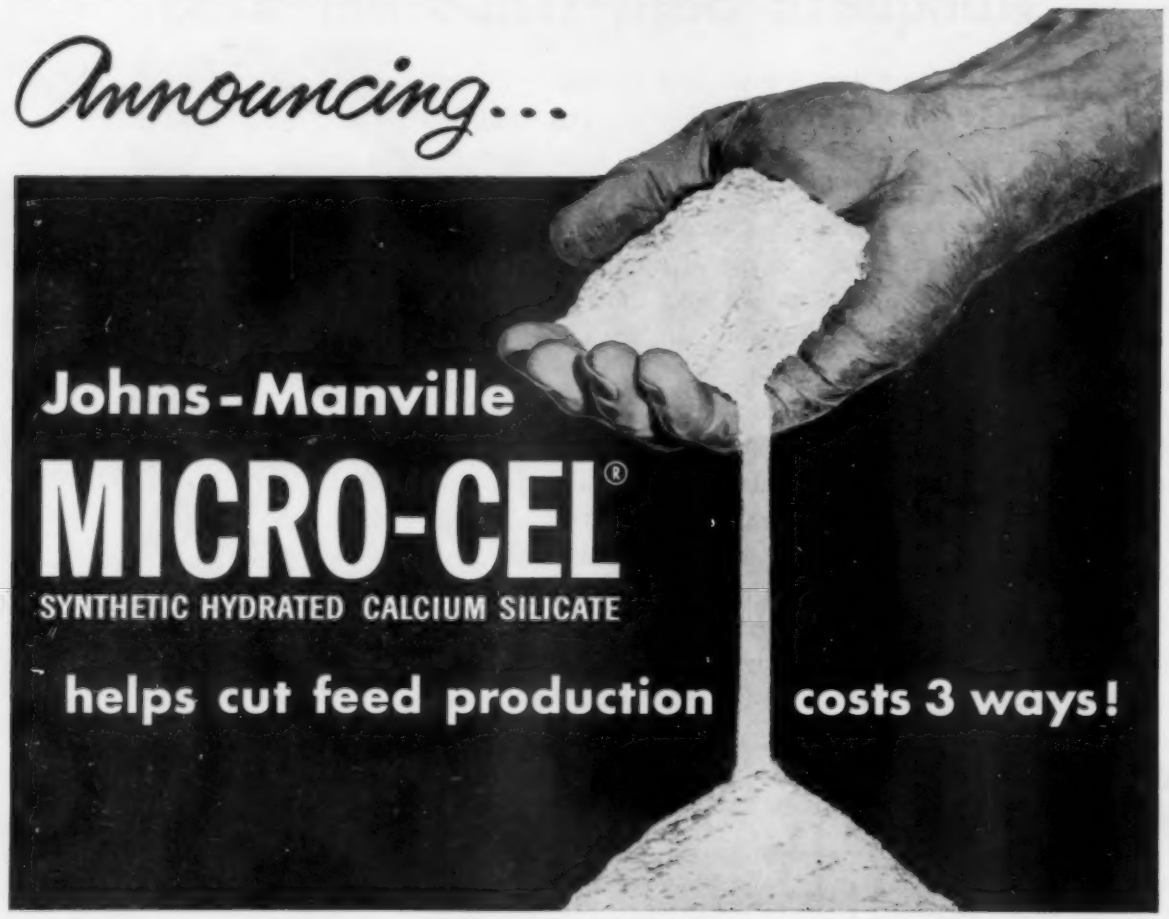
The company has also named a technical service staff for the New Orleans and Los Angeles areas. Eugene C. Bristol has been appointed technical service representative for the New Orleans, Dallas, Texas, and Atlanta, Ga., districts. Robert J. Gigler has been named technical service representative for the West Coast.

Announcement of the appointments was made by Jason M. Elsas, regional manager.

Mr. Elsas also announced the appointment of C. Shannon O'Neill, formerly with another firm in New Orleans, as export sales representative. Mr. O'Neill is presently covering Latin America under the direction of Peter H. Walmsley, regional operations manager. Improvement of the multiwall division's customer service has been provided for by placing its operations under the direction of Mr. Walmsley. William H. Richmond, an employee of the division in California, has been named customer service manager at the Torrance plant.

Another move to improve customer service has been shifting of the Denver office to jurisdiction of the Torrance district, said Mr. Elsas.

Announcing...



A new, highly absorbent inert that reduces feed processing problems

TO HELP THE FEED INDUSTRY meet the demand for modern feeds—to help cut feed production costs—Johns-Manville Research now offers a new feed processing aid—Micro-Cel—"the powder that flows like a liquid."

1. Prevents caking of feed supplements and molasses feeds. At extremely low levels, Micro-Cel can eliminate the problem of caking in feeds and dry supplements. Micro-Cel in quantities as low as 1% allows a higher molasses addition in mash or pelletized feeds. Added to antibiotics and other hydroscopic materials, Micro-Cel can maintain free-flowing properties of material from manufacturer to mill.

2. Improves pellet hardness—reduces amount of fines. Pure, inert Micro-Cel, at levels of only ½ of 1%, can improve pellet hardness, reducing shipping problems and customer complaints. This clean, free-flowing powder will not impair nutrients—can be added to mix or premix without changes in existing mill equipment.

3. Eliminates the need of handling liquid fats. Micro-Cel promises a totally new concept of stabilized fat handling—by offering a way to ship and handle fats in *dry, powder form*. Because of Micro-Cel's tremendous surface area, it can absorb and carry liquids in quantities up to 300% of its weight and still remain free-flowing. A 3 to 1 combination of Micro-Cel and either liquid or solid fat provides a free-flowing powder that can be shipped, handled and added to feeds *without heating*.

Find out what Micro-Cel can do for you. For literature, and samples of the proper grade for your application, write to Celite Division, Johns-Manville, Box 14, N. Y. 16, N. Y. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE

JOHNS-MANVILLE PRODUCTS

More profit on feed when you mix your own brand!

BROWER Whirlwind FEED MIXER

Earn up to $1.50 profit per bag by mixing your own brand of feed with the BROWER MIXER . . . the extra profits soon pay for it! WHIRLS the ingredients instead of just tumbling them . . . mixes a perfect blend in about 10 minutes . . . fast, economical! Built for years of trouble-free service. Five sizes. World's Largest Selling Mixer!

BROWER MFG. CO., 566 N. Third St., Quincy, Ill.

Write for FREE CATALOG

NOW . . . AUTOMATION COMES TO GRAIN AERATION!

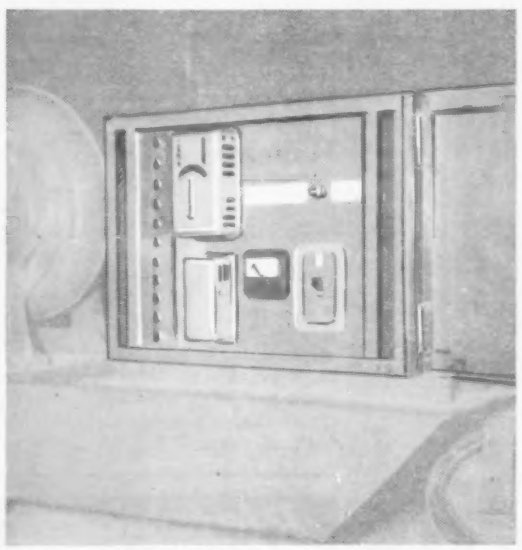
What Once Cost Dollars Douglas Does For Pennies

HOTSPOTS! . . . One of The Biggest Headaches Of Grain Storage. With your Pre-Engineered Douglas Grain Aeration System automatically on the job, hotspots don't get a chance to develop. When outside temperature and humidity become ideal for aerating the grain mass Douglas Aeratrol snaps into action. If outside conditions are unfavorable at the moment, Aeratrol waits till later in the day.

Turning grain is a thing of the past! You don't have to lose profit any longer because of dockage and "turning shrinkage". You don't need to spend hours and dollars in labor and power.

A Grain Aeration System with a WRITTEN GUARANTEE. Every piece of your Pre-Engineered Douglas Grain Aeration System has been pre-proved in actual storage use. This is why Douglas guarantees every custom designed aeration system to perform exactly as specified *in writing!*

Installation Of The Duct Work Is So Simple You Can Do It Yourself. Your Pre-Engineered Douglas Aeration System is delivered to you ready to install. Ducts for each bin are marked for installation as each bin becomes available. You don't have to wait until all bins are empty.



NOW . . . Automatic Temperature and Humidity Controls Make Douglas Aeration Automation A Reality!

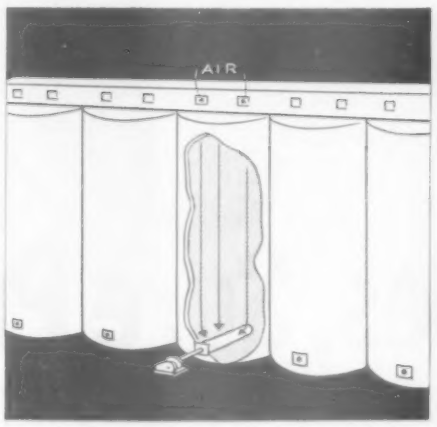
Outside moisture and temperature variations operate the Douglas Grain Aeration System automatically. Just set the controls of Douglas' exclusive Aeratrol and forget it. Douglas Aeration does the rest.

Your Increased Profit Can Pay For Your Custom Built Pre-Engineered Douglas Aeration System In As Little As Six Months!

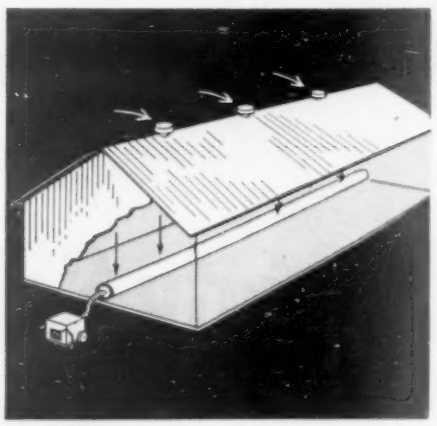
Get the Facts TODAY! See why Douglas Aeration gives you the most economical, most efficient grain aeration possible. Mail This Coupon For Full Story . . .

See What Douglas Can Do For You . . .

- Cool Stored grain to prevent or arrest mold growth and insect activity.
- Prevent moisture migration and damage.
- Reduce or remove some odors.
- Get better kill from fumigants.
- Stop dockage and shrinkage due to turning.
- Get full use of every bin in your plant . . . No need to hold empty bins ready for turning.



Large storage plants operate more profitably with the Douglas Aeration System. Every bin is a profit maker . . . none need be left empty for turning grain later.



Pre-Engineered Douglas Aeration System is especially valuable in flat storage where turning is prohibitively expensive.

Douglas Chemical Co., Grain Aeration Division
620 East 16th Avenue, North Kansas City, Missouri

I want the **full** story on **full storage profits** that are now possible with a Pre-Engineered Douglas Aeration System.

Name_____

Firm_____

Address_____

City_____ State_____

We have_____(number) bins of_____ (flat, vertical) type, with about _____ bushels capacity.

DOUGLAS CHEMICAL COMPANY

GRAIN AERATION DIVISION

620 East 16th Avenue **North Kansas City, Mo.**

A. E. STALEY AWARD WINNERS—Top award winners in Staley's starter feed sales jamboree sponsored by the A. E. Staley Manufacturing Co., Decatur, Ill., are (left to right) Bob Farrow, Jacksonville, Ill.; Joe Douglass, Decatur, Ill., and Chic Spindler, Newburgh, Ind., shown here receiving prizes from Lloyd A. Winslow, Staley's formula feed department manager. Each of the salesmen received a week's all-expense trip to New York City for himself and his wife.

A. E. Staley Names Feed Contest Winners

DECATUR, ILL. — Dealers and salesmen who won top awards in recent contests sponsored by the feed division of the A. E. Staley Manufacturing Co., have been announced.

The A. K. Zinn Feed Store, Battle Creek, Mich., was first in the "watch us grow" chick marathon display contest for the firm's dealers. Second place went to the Home Acres Feed Store, Grand Rapids, Mich., and third went to Havana (Ill.) Milling Co.

Prizes were given for outstanding store displays of chick growth on Staley's feeds.

Top award winners among salesmen in Staley's starter feed sales jamboree were Bob Farrow, Jacksonville, Ill.; Joe Douglass, Decatur, and Chic Spindler, Newburgh, Ind. Each won a week's all expense trip to New York City for himself and his wife.

Thirteen other salesmen received cash awards. They are: E. H. Skiles, Rossville, Ind.; W. R. Hoffman, Clay City, Ind.; S. D. Young, Mt. Vernon, Ill.; K. C. Field, Effingham, Ill.; K. J. Raven, Springfield, Ill.; A. W. Lambert, Cambridge City, Ind.; W. T. Hale, Carbondale, Ill.; R. W. Golden, Monmouth, Ill.; H. R. Richardson, Decatur; Frank Hurst, St. Clair, Mich.; P. L. Collingwood, McComb, Ohio; W. T. Cadick, Grandview, Ind., and R. W. Emmons, Pittsfield, Ill.

The following dealers received honorable mention awards for their displays of chick growth on Staley feeds. Wingfoot Lake Hatchery, Suffield, Ohio; Barnes Feed & Grain, Taylorville, Ill.; Staley's Arcady Farm Supply, Springfield, Ill.; Manilla (Ind.) Hatchery; Hall's Produce, Mt. Sterling, Ill.; Terpstra Feed Store, Griffith, Ind.; Farmers Feed & Supply, Valparaiso, Ind.; Casner Grain Co., Oakley, Ill.; Lathrop Feed, Donnellson, Iowa; Target Feed Store, Mt. Vernon, Ill.; Target Feed & Milling Co., Eldorado, Ill.; Target Feed & Milling Co., Norris City, Ill.; C. E. Kissner Grain Co., Wayne City, Ill.; Rolosons Feed & Seed, Brown City, Mich.; Michigan Bean Co., Croswell, Mich.; Michigan Bean Co., Vestaburg, Mich.; Mac's Feed Mill, Greensburg, Ind.; Harold's Hatchery, Danville, Ill.; Mattingly Feed Store, Loogootee, Ind.; J. C. Erwin Feed Mill, Daylight, Ind.

Marketing Order Law Proposed in Minnesota

ST. PAUL—A proposed Minnesota marketing order law aimed at controlling entry of products from states which now discriminate against Minnesota's farm output will be up for a hearing Nov. 14 by the Minnesota State Legislative Interim Commission on Agricultural Problems.

In connection with the Minnesota proposal, Waldo E. Johnson of the Minnesota Agriculture Department, cited a Florida law which he said favors that state's poultrymen to the detriment of eggs shipped from Minnesota. He said Florida now insists that all incoming eggs be graded there at the outside shipper's expense and stamped, "from outside the state."

Mr. Johnson said this law was cutting deeply into Minnesota egg shipping to Florida, despite the fact that Florida's citrus fruits come into Minnesota without discrimination.

Proponents of the Minnesota marketing law contend it would serve to upgrade Minnesota products being shipped out, and serve to make the state's output more attractive to consumers.

Honeggers' Dividend

FAIRBURY, ILL. — Honeggers' & Co., Inc., Fairbury, will pay its fifth consecutive quarterly dividend Nov. 15, according to announcement by E. F. Dickey, executive vice president. The dividend was declared by the board of directors Oct. 14 and is payable to shareholders of record at the close of business on Oct. 30. It consists of 1½ shares of common stock per 100 shares held, with fractional shares payable in cash on the basis of value of $30 per share.

Steady Sales, Sure Profits

are yours when you stock and promote

Pilot Brand Oyster Shell

Pilot Brand is a best-seller for feed dealers coast-to-coast. Here are important reasons why:

Pilot Brand is an ideal eggshell material.
Helps poultry raisers get maximum production of stronger-shelled eggs.
It's uniformly pure calcium carbonate, kiln-dried.
Costs less per usable pound.
Hens, chicks, turkeys, poults need it year 'round.

Powerful national advertising for more than thirty years has constantly increased sales of Pilot Brand and assured profitable repeat business for dealers everywhere.

Remember, there is no adequate substitute for Pilot Brand Oyster Shell. It's a sure-fire business builder.

Order from your distributor . . . or write to us

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Oyster Shell Products Company
Mobile, Alabama

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NEW FORTIFIERS for LOWER FEED COST!

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new **STARTER SWINEX WITH DYNAFAC**
New Growth and Anti-Scours Agent

WRITE TODAY For Complete Report on These New Fortifiers! DEPT. 2118

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Main Plant and Offices WAUKEGAN, ILL. | Midwest Plant Des Moines, Iowa | West Coast Division Nampa, Idaho

Feed Research Leads To Studies in Injuries Caused by Radiation

ST. PAUL, MINN.—An example of how research in feeds can lead to studies of vital importance to man in an atomic age was cited by Dr. Max Schultze, biochemist at the University of Minnesota, at a Twin City Nutrition Seminar here this week.

Speaking on "Radiation Injury Simulated by a Toxic Substance," Dr. Schultze said there is a marked similarity in the reaction of calves fed trichlorethylene extracted soybean oil meal (TESOM) and exposure to ionizing radiation from Cobalt 60.

Massive hemorrhage and the destruction of certain blood components result, and the animal develops aplastic anemia, he said.

He said it is also interesting to note that calves, which have a much lower resistance to the injury caused by feeding TESOM than most other animals, also are more susceptible to radiation injury than other animals tested. Calves will ultimately die from an exposure to about 250 roentgens, while other animals heretofore tested require 500 or more, Dr. Schultze said.

Workers at the Northern Regional Research Laboratory, Peoria, Ill., and Dr. J. C. Picken, veterinary physiologist at Iowa State College, have synthesized from chemicals a substance, S-(dichlorovinyl)-L-cysteine (DCVC) which had produced aplastic anemia and the same general response in calves as TESOM.

DCVC thus simulates ionizing radiation, Dr. Schultze said, and studies are now being made into the reasons for aplastic anemia. Aplastic anemia is a special form of the disease in which the blood-forming marrow of the bone is defective.

The second speaker of the evening, Dr. H. H. Hoyt, college of veterinary medicine, spoke on "Disease and Nutrition Problems in the Field." He mentioned several disease problems currently facing veterinarians and indicated that some of them may be the result of modern feeding methods.

"We're in an age where we hear nothing but additives and stresses," he said. "I hear so much about stress I get distressed. And as far as additives are concerned, there are so many of them I sometimes wonder where we'll put the corn and oats."

Despite the fortification in modern feeds, he said, animals are still developing vitamin deficiencies. Another current problem is feedlot diarrhea, for which there are many possible causes.

He pointed out that cattle come into the feedlot off grass and "may go onto 18 lb. corn cob meal and everything added within eight days. They get little or no hay, but there are plenty of additives. Who knows what this is doing to this animal?"

Apparently new diseases being encountered also make the veterinarian wonder whether modern feeding might not be at least partly to blame, he said. One is the so-called puffer's disease, for which a causative agent can't be found. Another group is the mucosal diseases.

"The question is—why are they showing up as they are? Is it partly due to practices of feeding and management?"

Dr. E. V. McCollum Selected for Award

KANSAS CITY—Dr. Elmer V. McCollum has been selected to receive the Charles F. Spencer Award for 1958. He is a biochemist and emeritus professor at Johns Hopkins University.

The award, given for contributions to the field of agriculture and food chemistry, is administered by the Kansas City section of the American Chemical Society, and is sponsored by Kenneth A. Spencer, president of the Spencer Chemical Co., Kansas City.

Dr. McCollum is credited with the discovery of vitamin A, the distinction between vitamin A and vitamin D, and pioneer work on vitamin B. His work in evaluating feeds and foods biologically laid the groundwork for the study of the nutritive needs of farm animals and for major improvements in their care.

The award, a medallion and a $1,000 honorarium, was founded by Mr. Spencer in honor of his father, Charles F. Spencer, who died in 1942.

The award will be presented in Kansas City Nov. 14 by Dr. Nat C. Robertson, vice president of Spencer Chemical.

Previous winners of the award are Dr. Conrad A. Elvehjem, Dr. Ralph M. Hixon and Dr. William Cumming Rose.

Abbott Moves Sales Center in New Orleans

NORTH CHICAGO, ILL.—Abbott Laboratories, with headquarters here, has occupied a new distribution center and area sales headquarters in New Orleans, it was announced by Herbert S. Wilkinson, vice president and director of sales.

The company's new branch headquarters at 916 Dakin St. replaces the former branch at 736 St. Charles St. It serves Louisiana, southern Mississippi, and southern Alabama.

A one-story brick and steel structure, the new building contains 16,363 sq. ft. of floor space. Warehousing facilities occupy 13,955 sq. ft., with the remainder of the building devoted to offices, employee lounges, and a lunchroom. Loading facilities are provided for four trucks.

Floyd C. Waggoner is the New Orleans branch and district manager. Branch supervisor is N. J. Barone.

Abbott has maintained a New Orleans branch since 1931.

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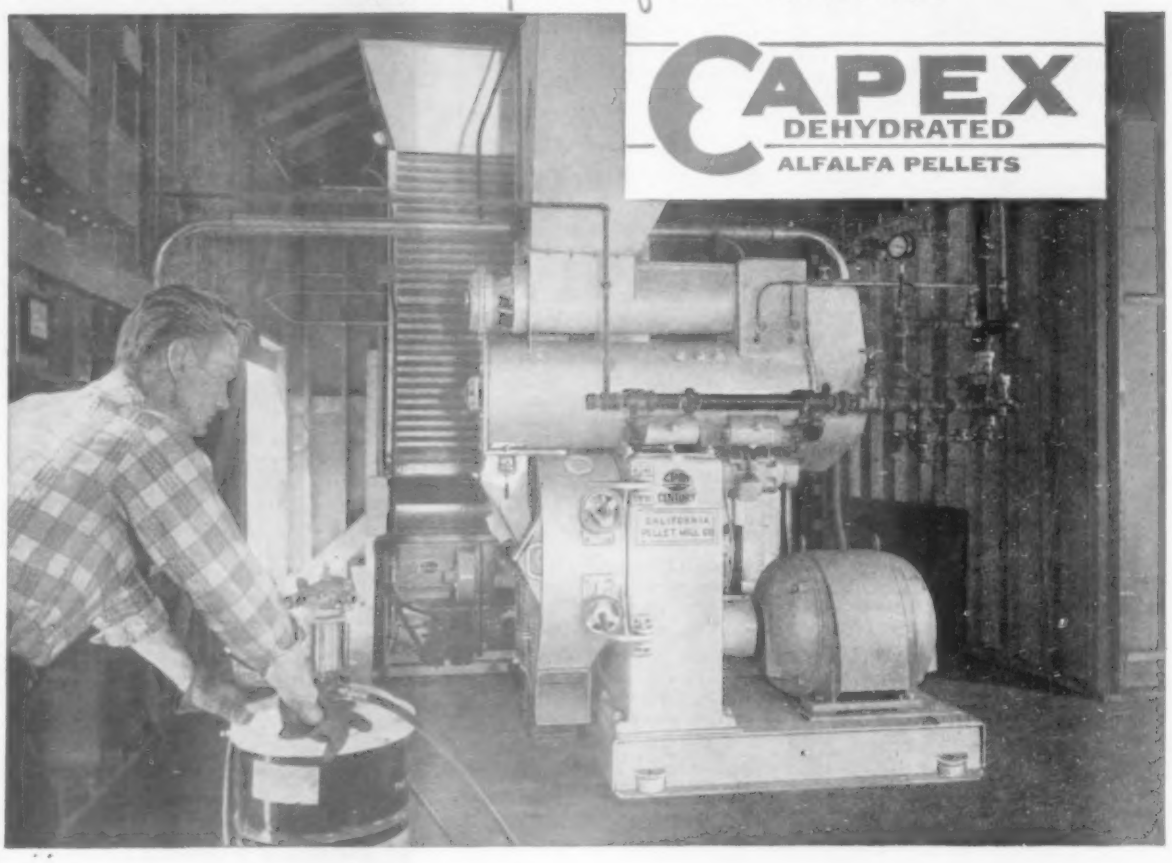

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ONE CPM LEADS TO ANOTHER

There's nothing like experience with one California Pellet Mill to help you decide on another when the time comes for new pelleting equipment.

The A. B. Caple Company, for example, has operated a CPM "Century" 100 in their Toledo, Ohio plant for the past two years. So when they decided early this year to add a pelleting section at their Tontogany, Ohio plant, choice of another CPM "Century" was a natural one.

To take full advantage of the fast-expanding market for pelleted feeds, it will pay you to follow the leaders who make CPM their first choice—and who repeat on CPM when additional units are needed.

Let CPM research, experience, and know-how as pioneers of pelleting equipment, help you select the *one* model that best fits your needs—one that will *continuously produce more pellets per horsepower at lowest cost per ton!* Write for full information or call your nearest CPM representative.

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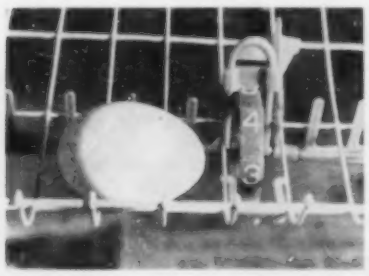
New Products
New Services
New Literature

This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 7250—Automatic Egg Counter

A fully automatic egg counter has been introduced by Hawkes Cage System. Eggs rolling from the cage into an aisle automatically trip the



counter. The counter records up to seven eggs without resetting. It can be used efficiently for the once a week check, the company says. The unit is made of plastic. Check No. 7250 on the coupon and mail to this publication for further details.

No. 7242—Scale Data Sheet

Description of Richardson model MSM scale for bulk weighing of dry and free-flowing and sluggish materials is included in a new product data sheet offered by the Richardson Scale Co. The two-color sheet explains how the scale weighs and records mechanically the weights of materials. Check No. 7242 and mail for details.

No. 7246—Poultry Disease Booklet

"A Short Story About Trithiadol and Coccidiosis" has just been published by Sterwin Chemicals, Inc. The booklet contains information about the coccidial parasite—its life cycle, action and effect on the chicken. The concept and importance of immunity are discussed in detail and the mode of action and effectiveness of trithiadol are covered. For copies, check No. 7246 on the coupon and mail to this publication.

No. 7249—Poultry Health Folder

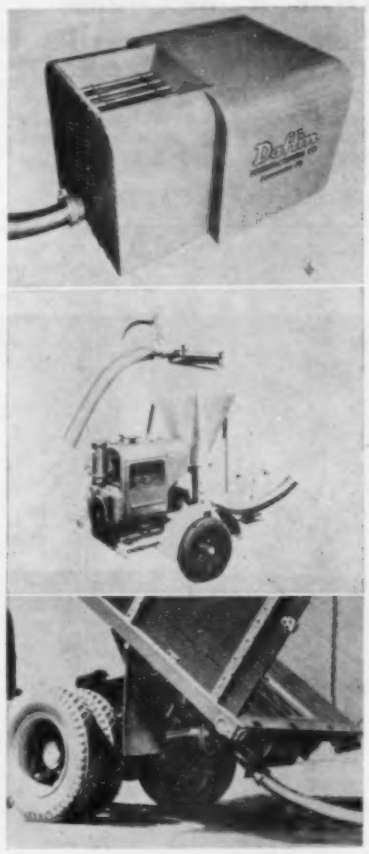
Information on treatment of blackhead and hexamitiasis is contained in a new, two-color folder issued by Merck & Co. The title of the folder is "Feeds Containing HepZide Prevent Blackhead and Hexamitiasis Before They Start." Described in the folder is the value of HepZide in preventing blackhead in chickens and turkeys and hexamitiasis of turkeys. For details, check No. 7249 and mail to this publication.

No. 7244—Formula Feed Folder

Sohio Chemical Co. has issued a four-page folder telling manufacturers how they can profit "both in handling and manufacturing of their formula feeds." Highlighted in the publication is Sohio's new microprilled feed urea. The booklet gives data and specifications about the material. Check No. 7244 on the coupon and mail to this publication for details.

No. 7245—Materials Handling Units

Daffin Manufacturing Co. announces three new pneumatic materials handling systems. The units, pictured here, include the Daffinaire Conveyor (top), the VAC-Conveyor (center), and the Bulk Truck Unloader. The Daffinaire conveyor is



designed for in-the-plant use and is capable of handling up to 15 tons per hour of free-flowing feedstuffs, the company says. The VAC-Conveyor is mounted on a trailer for over-the-road use. The capacity is 10 tons per hour. The bulk truck unloader will fit any type truck with a power take-off, the company says. For more information, check No. 7245 and mail.

No. 7248—Animal Health Folder

Uses of six biologicals produced and distributed by Merck & Co., Inc., are included in a folder, "For Controlled Protection," recently issued. The biologicals are for cattle, swine, sheep, horses, goats and turkeys and the publication includes descriptions of them plus dosages. Copies can be obtained by checking No. 7248 on the coupon and mailing to this publication.

No. 7252—Hammermill Literature

A catalog sheet has been issued by the Prater Pulverizer Co. containing information on the Prater Challenger Hammermill. The insert briefly describes the features and highlights of the company's two models now available: The Dual-Power Challenger and the Single Power Challenger. The publication is called Bulletin CH-M 581. For details, check No. 7252 and mail to this publication.

No. 7251—Poultry De-Winger

Dakota Ranches is manufacturing and distributing nationally the "De-Winger," a device which the company says speeds de-winging. The machine can be used on all ranged chickens, turkeys, pheasants and other game birds. It consists of an electrically heated wire which severs and cauterizes in one motion. The company states the device will cause no mutilation or grow-back, no burned fingers, no bird mortality or fire danger. For further information, check No. 7251 on the coupon and mail to this publication.

Also Available

The following new products have been described in previous issues of Feedstuffs and information about them may still be obtained by jotting the appropriate number on the coupon and forwarding it to Feedstuffs.

No. 7173—Pig and poultry feed unit, J. B. Sedberry, Inc.

No. 7174—Industrial fan bulletin, Day Sales Co.

No. 7175—Packaged gas produc-

Send me information on the items marked:

- ☐ No. 7242—Scale Data Sheet
- ☐ No. 7244—Formula Feed Folder
- ☐ No. 7245—Materials Handling Units
- ☐ No. 7246—Poultry Disease Booklet
- ☐ No. 7248—Animal Health Folder
- ☐ No. 7249—Poultry Health Folder
- ☐ No. 7250—Automatic Egg Counter
- ☐ No. 7251—Poultry De-Winger
- ☐ No. 7252—Hammermill Literature

(PLEASE PRINT OR TYPE)

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Denver, Colorado

W. M. GILLIES, INC.
244 California Street
San Francisco 11, California

GOOD-LIFE CHEMICALS, INC.
310 South First Street
Effingham, Illinois

HOLT PRODUCTS COMPANY
Box 840
Milwaukee 1, Wisconsin

KINDSTROM-SCHMOLL COMPANY
418 Flour Exchange
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M. A. McCLELLAND COMPANY
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ing equipment, Southwest Industries, Inc.

No. 7176—Rental program for Tote bins, Tote System, Inc.

No. 7177—Poultry feed fortification product, Borden Co.

No. 7178—Automatic tubular water warmer, Smith-Gates Corp.

No. 7179 — Handbook on copy boards, Wagner Sign Service, Inc.

No. 7180—Bulk shipping container, Ohio Boxboard Co.

No. 7181—Steel buildings in color, Stran-Steel Corp.

No. 7182—Grain drying equipment catalog, Aeroglide Corp.

No. 7183—Broiler, layer coccidiostat, American Cyanamid Co.

No. 7184—Four-ton capacity bulk feed bin, Leach Manufacturing Co.

No. 7185—Automatic bag closure literature, Aeroglide Corp.

No. 7186 — Automatic "tare-out" system, Richardson Scale Co.

No. 7187—Bulletin on pneumatic conveyor design, Sprout, Waldron & Co.

No. 7188 — Modern farming film, Stran-Steel Corp.

No. 7189 — Poultry vaccination booklet, Vineland Poultry Laboratories.

No. 7190 — Feeding trial results brochure, Flavor Corporation of America.

No. 7191 — Trough-belt conveyor, Universal Hoist Co.

No. 7192—Grain roller mill, W-W Grinder Corp.

No. 7193—Vacuum barrel handling unit, Vac-U-Lift Co.

No. 7194—Grain fumigator, Seedburo Equipment Co.

No. 7195—Bulk-bag feed body, Henderson Manufacturing Co.

No. 7196 — Fourteen-hole laying nest, Oakes Manufacturing Co.

No. 7197—Peebles' 50-lb. red whey block, Western Condensing Co.

No. 7198—Bulk feed bins, Brock Manufacturing, Inc.

No. 7199 — Ball bearing attrition mills, Munson Mill Machinery Co.

No. 7200—Fall promotion displays, American Cyanamid Co.

No. 7201—Poultry health product, Pabst Brewing Co.

No. 7202—Worm control brochures, Rhodia, Inc.

No. 7203—Poultry disease book, Dr. Salsbury's Laboratories.

No. 7204—New series of pellet mill dies, Sprout, Waldron & Co., Inc.

No. 7205 — Spring materials handling truck, Everlevell Co.

No. 7206—Bulk feed handling report, Dorsey Trailers.

No. 7207—Seaweed feed additive, Algit, Inc.

No. 7208—Storage structure booklet, Sprout, Waldron & Co., Inc.

No. 7209—Feed blender with meter, Barnard & Leas Manufacturing Co., Inc.

No. 7210—Exhibit display, Federal Displays, Inc.

No. 7211 — Range feeding cyclone attachment, Sprout, Waldron & Co., Inc.

No. 7212 — Industrial fan bulletin, Day Co.

No. 7213—Mobile floor crane, Vanguard Engineering Co.

No. 7214—Magnetic drum separators, Eriez Manufacturing Co.

No. 7215 — Injectable antibiotics, Merck & Co., Inc.

No. 7216 — Grain fumigant literature, The Dow Chemical Co.

No. 2053—New bag concept, Bemis Bro. Bag Co.

No. 7218—Case imprinting machine, Rotary Imprinters, Inc.

No. 7219—Formula changeover control system, Richardson Scale Co.

No. 7220—Packing or bagging scale, Thayer Scale Corp.

No. 7221—Grain conveyor literature, Vac-U-Vator, division of Dunbar Kapple, Inc.

No. 7222—Corn grader technical bulletin, Sprout, Waldron & Co., Inc.

No. 7223 — Automatic self-feeder for hogs, Baughman Manufacturing Co.

No. 7225—Conveyor trough, Screw Conveyor Corp.

No. 7226—Portable feed mixer, Green Isle Manufacturing Co.

No. 7227—Animal health product, the Dow Chemical Co.

No. 7228—Used lift truck buying and trading service, Clark Equipment Co.

No. 7229—Liquid tote tanks, Tote System, Inc.

No. 7230—Weighing and filling machine, Richardson Scale Co.

No. 7231—Portable crop dryer, the Mathews Co.

Work Progressing on New Oregon Feed Mill

TILLAMOOK, ORE.—Construction of the new $285,000 feed mill and warehouse being built by the Tillamook County Creamery Assn. is progressing rapidly.

Workmen have torn down the old warehouse, and its contents have been moved to other storage facilities until the new warehouse is built.

A 40 x 40-ft. concrete basement room has been constructed so that heavy machinery may be installed on its roof, which lies even with the floor of the warehouse.

Plans call for the feed mill to be built in two sections, with the office and adjoining sales room to be constructed as a second section.

The plant will be complete with storage tanks and partitioned warehouse, and a 95-ft. tower with 28 bins.

Engineering layout and design was done by Reid-Strutt Co., Portland, Ore.

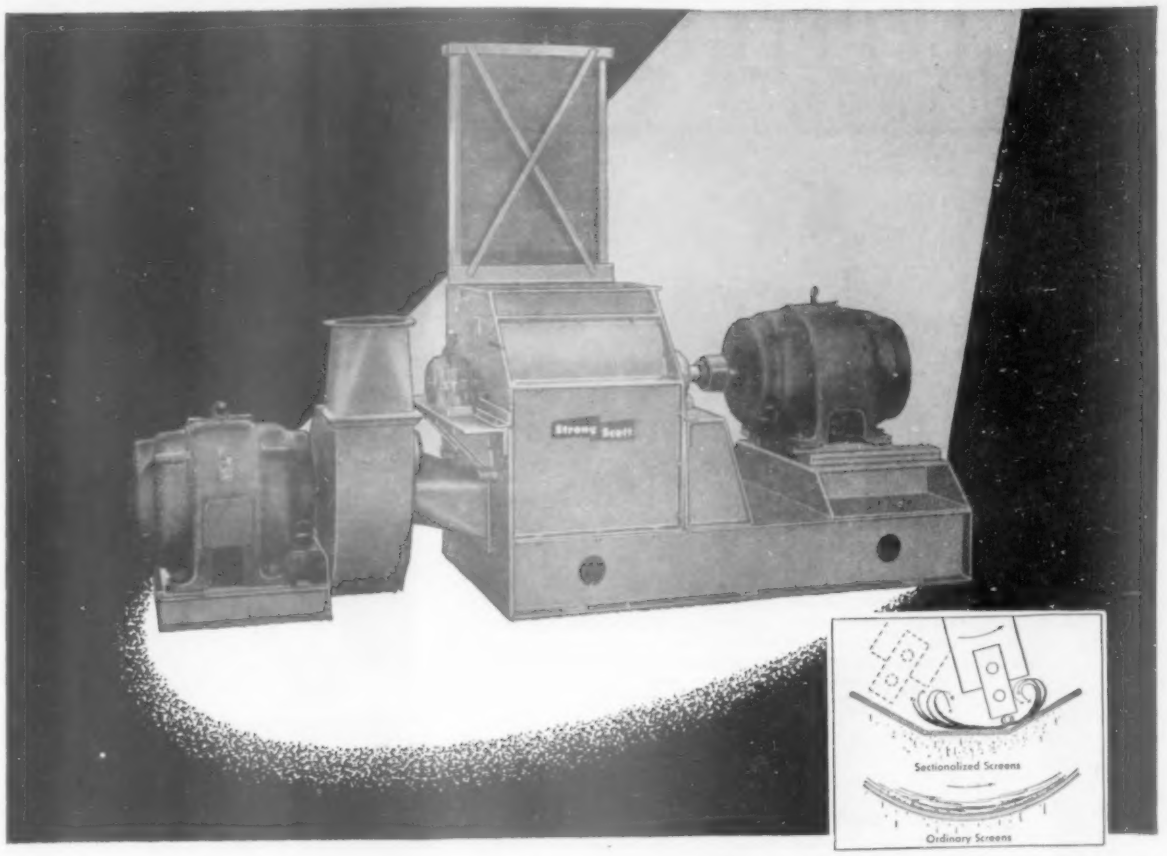
The exterior of the mill will be steel, bronze in color, with a green roof.

PLANS SOYBEAN PLANT

MAPLETON, MINN.—Frank Bros. Feed & Grain Co. will soon open a soybean processing plant here.

ROADSIDE EGG VENDOR
Now Available on Time Payments

Here's an Egg Salesman who never sleeps. Yes, with the "T-LINE" EGG VENDOR you can get retail prices for your eggs which means an extra 10c per dozen profit. It's the way to turn your egg venture into a profit maker . . . If you are located on a well traveled highway near town or know of a good spot such as a gas station, large apartment building, parking lot, etc. The "T-LINE" EGG VENDOR is a proven unit. Fully automatic refrigeration and hight humidity. Holds 112 dozen eggs in vending position plus refrigerated storage for an additional 120 dozen eggs. Write today for literature and time payment plan to TOBIAS ENTERPRISES, 326 North Michigan Avenue, Chicago 1, Illinois.



Strong-Scott presents a new idea in Hammermill operation

Sectionalized screens offer higher capacities through "Vortex Grinding Action"

The exclusive sectionalized screens in the new Strong-Scott Hammermill assure increased grinding capacities through "vortex grinding action" (see photo upper right).

Specially hardened screens . . .

Because the screens are flat, they can be subjected to a special hardening process and are guaranteed to wear 10 times longer than ordinary curved screens. This drastically reduces your production costs. The special hardening means the perforations retain their sharper edges and original size longer. This produces a more uniform, quality controlled product at a greater capacity for the entire life of the screens.

For your convenience, Strong-Scott maintains a "Production Testing Service," complete with their full line of Grinding, Mixing and Separating equipment. Write to Strong-Scott for full details of this no-cost service.

WITH VORTEX GRINDING, material cannot roll along the surface as on ordinary curved screens. Instead, the shallow valleys made by the joining of the screen sections bounce the material back into the grinding area. This produces an air attrition grinding of particle on particle, in addition to the impact grinding on the hammers, resulting in higher tonnages per hour.

REMOTE CONTROL SCREEN CHANGE—Only the new Strong-Scott Hammermill offers quick-changing up to seven screens from a remote location elsewhere on the floor above. Also, reversible rotation in this Hammermill adds to the long life of the screens.

Equipment Designed for Better Processing

The Strong Scott Mfg. Co.

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Minneapolis 13, Minnesota

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☐ **New Hammermill Bulletin**

☐ **Production Testing Information**

Name .....

Address .....

City ..... State .....

Feed Service Bulletin Board

Helpful Notes on Feeding and Management for Feed Men and Their Customers

Stop Lice Threat

There are better "tools" available this fall for fighting cattle lice. And late fall or early winter is the best time for producers to go to work on this potential threat to profits, because lice populations are just beginning to increase at this time.

For milk cows, say research entomologists, use either rotenone or pyrethrins. Rotenone can be applied dry, in the 1% dust form. For a spray, 1 lb. of 5% rotenone powder should be mixed in 100 gal. water. The treatment should be repeated 15 days after the first treatment.

Pyrethrins come in spray form only. They also must be repeated 15 days after the first treatment.

For beef cattle, the choice is wider, including rotenone, pyrethrins or any one of the following materials: Co-Ral, lindane, malathion, methoxychlor or toxaphene. None of these last five chemicals named are cleared for use on milk cows, however.

For using these materials on beef cattle:

Co-Ral, the newest available, should be mixed at 16 lb. of 25% wettable powder in 100 gal. water. Cattle must not be treated within 60 days of slaughter.

Lindane can be used as a spray or dip. One pound of 25% wettable powder is mixed in 100 gal. water, or an alternate of 1.3 pt. of 20% emulsion in 100 gal. This treatment isn't to be used within 30 days of slaughter.

Malathion is used at 16 lb. of 25% powder in 100 gal. water or 3 qt. of 50 to 57% emulsion in 100 gal. water. Only animals more than a month old should be treated.

Methoxychlor is used as a spray or dip, putting 8 lb. of 50% powder in 100 gal. water.

Toxaphene should be mixed at 8 lb. of 50% wettable powder in 100 gal. water, or at 5 pt. of 60 to 66% emulsion in 100 gal. water. This chemical shouldn't be used within 28 days of slaughter of the cattle. With this chemical, and several of the others, a washday detergent is often added to the mixture to improve wetting and penetration. About 1 to 2 lb. of the detergent may be used in each batch. Approximately 2 gal. of finished spray is applied to each animal.

◆

Feedlot Size Studied

The advantages of increasing the number of beef cattle fed out at one time, from the efficiency standpoint, have shown up in a recent University of Minnesota study of 59 cattle farms in southern Minnesota. The added efficiency achieved with larger numbers can make a big difference in profits, university economists report.

Starting with the relatively small feedlot of around 30 feeder calves, the Minnesota researchers found that increasing to 40 or 50 head called for very little more time in caring for them.

Thirty long-fed calves required about 7 hours' labor a week, or an hour a day for regular chores while on limited feed of grain in drylot. This was for hand-feeding hay, silage and grain twice daily. It also included bedding the animals two or three times weekly, watering and observation, care of sick animals and grinding feed on the farm. Hauling manure, using a tractor scoop in the operation, and other tasks took about 90 hours for the feeding season.

Adding more cattle took only 50 additional minutes a week for regular chores for each extra 10 head and about 7½ hours more for the entire feeding period for handling manure and other jobs. This rule held up to about 120 head, with all calculations based on hand labor. Agricultural economists making the study were R. G. Johnson and T. R. Nodland.

Compared aonther way, 40 head of calves took 400 hours of labor over a 49-week period, which included six weeks on corn stalks. Herds of 80 required only 50% more, or 600 hours. From the study, the economists came up with this formula for estimating total labor hours for a typical long-fed calf program: Multiply the number of head by five and add this figure to 200.

Biggest increases in efficiency come from enlarging small herds, they point out. For example, increasing from 20 to 30 head reduces labor per animal by 22%. But going from 50 to 60 head cuts labor by around 7½% per head.

When should mechanization enter the picture? Mr. Nodland observes that "somewhere around 100 to 125 head, it probably would pay a feeder to look at feedlot mechanization closely. Up to that point, he can get by but in some cases might justify such a move even earlier."

◆

Hog Profit Factors

Four of the most important management factors in swine production, according to L. J. Kortan,

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Dr. T. J. Cunha
University of Florida

"Ten percent or more of alfalfa meal should be included in all drylot protein supplements for swine. There is no single feed ingredient that contributes more to balancing swine rations during pregnancy in dry lot than dehydrated alfalfa meal."

Dr. W. M. Beeson
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South Dakota State College swine specialist, are:

1. Feed conversion. Feed required may vary from a low of 350 lb. to a high of 500 lb. of grain and protein to produce 100 lb. of hog.

2. Pigs weaned per litter are the second important factor. Some farms wean and raise eight pigs per litter; other farms wean and raise only five or less per litter.

3. Death loss after weaning should be held down to 1.5% or less of the total weight produced.

4. Marketing procedure. Hogs must be marketed when they reach their best weight and before they become so heavy that their gains are no longer efficient. From 210 to 225 lb. can often be the upper limit.

Report Sinusitis Cured In Ohio Experiments

WOOSTER, OHIO — It has been found at the Ohio Agricultural Experiment Station that erythromycin, an antibiotic, will cure sinusitis in turkeys.

Researchers at the station tested the drug on 600 birds by injecting it into the turkeys' sinuses, and found it to be completely effective in turkeys purposely infected, and 88% effective among those who caught sinusitis naturally.

For turkeys, sinusitis is at least as bad, and in some ways worse, than for humans, according to Dr. L. Charles Gale of the experiment station.

He pointed out that the "upper form," which is easy to detect, gets into turkey sinus cavities around the beak, causing noticeable swelling and sometimes blindness of one or both eyes. The "lower form," which affects the bird's respiratory air sacs, does not show, but causes gasping and rattling in the turkey's breathing.

"You can tell a sick turkey by looking, anyway," said Dr. Gale. "Their feathers ruffle, their wings droop, and they look miserable." He also mentioned that when one gets sick, especially if it loses its eyesight, the rest of the flock will pick him to death.

"The sinus ailment has been a very serious problem in the turkey industry, because even the birds that live lose weight. Also, the sinus infection is transmitted through turkey eggs to another generation," Dr. Gale said.

A. H. Hamdy and Dr. Vance Sanger, along with Dr. Gale, helped conduct the experiments.

Referring to erythromycin as a treatment for sinusitis in turkeys, Dr. Gade said, "it is definitely superior to any other antibiotic we've used."

ANRC SPEAKERS — The theme of the annual Animal Nutrition Research Council meeting in Washington recently was amino acids. Shown here are several speakers who discussed various aspects of the subject. Left to right in the first picture are Dr. Kenneth H. Maddy, Monsanto Chemical Co., program committee chairman; Dr. H. S. Wilgus, Ray Ewing Co., Pasadena, Cal.; Dr. Jesse P. Greenstein, National Institutes of Health, Bethesda, Md., and Dr. James B. Allison, Rutgers University, New Brunswick, N.J. In the second picture are Dr. H. B. Geurin, Ralston Purina Co., St. Louis; Dr. Richard S. Gordon, Monsanto Chemical Co., St. Louis; Dr. Vernon Frampton, U.S. Department of Agriculture, New Orleans, and Dr. C. R. Grau, University of California, Davis.

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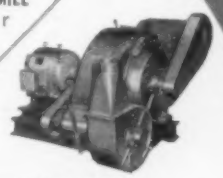

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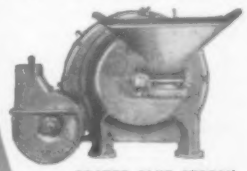

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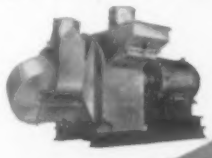

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WHAT'S NEW IN FEEDING?

Putting Research to Work

By Spencer H. Morrison, Ph.D., D.V.M.

Interrelationships of Protein, Lysine and Energy in Diets for Growing Swine

● R. P. Abernathy, R. F. Sewell and R. L. Tarpley, University of Georgia; Journal of Animal Science, Vol. 17, No. 3, August, 1958, pp. 635-639.

ABSTRACT

Sixty Duroc and Duroc X Yorkshire weanling pigs averaging about 40 lb. were allotted to 12 comparable groups of five pigs each, and then randomly allotted in a 2X2X3 factorial experiment to test the effect of protein levels, supplementary lysine and energy levels.

The rations used were of the corn-soybean meal-peanut oil meal-alfalfa meal type, and supplementary tallow was used as a replacement of corn to furnish energy variations. The protein levels used were 14% or 18%, while the lysine was supplied as l-lysine hydrochloride added at a level of 0.1% in those diets containing this supplement. The calculated methionine-cystine content of all diets was adjusted by the addition of crystalline dl-methionine to supply a constant level of approximately 3.3% of the dietary protein. Chlortetracycline was added to all diets at the 10 mg. per pound level.

The experiment was conducted on concrete dry-lot with water and feed supplied free choice. Individual weight gains and feed consumption were recorded at two-week intervals. The experiment was divided into two 42-day periods to determine the effects of the various treatments during not only the early growth stage, but also during the later finishing stage.

Pigs fed the 18% protein ration during the first 42 days (from 40 lb. to 110 lb. liveweight, approximately) gained significantly faster than those on the 14% protein ration when the weights were adjusted by analysis of covariance. Supplementation of the ration with 0.1% l-lysine during this period caused a highly significant growth depression. Increasing the fat content of the diet, and thus the caloric density, resulted in highly significant linear increases in gains. No significant interactions between protein with fat or lysine were observed during the first 42-day period.

The only treatment exhibiting a significant effect during the second 42-day period (approximately from 110 lb. to 190 lb. liveweight) was the addition of fat to the ration.

When the data for the two periods were combined, the addition of fat caused a highly significant linear increase in gains. The other variables did not exert a significant effect throughout the experiment.

At the conclusion of the trial, live-probe backfat measurements did not reveal any significant differences between treatments, although there was a slight trend toward increased backfat thickness with increasing dietary fat. Fat addition always improved feed efficiency of the diets.

COMMENT

We can look forward to more reports from the swine husbandry workers concerning amino acid supplementation and interrelationships of protein and energy in hog rations. The field has been made easier for them by workers in the poultry department—in fact, at a recent meeting of poultry workers one of the outstanding swine nutritionists was an interested listener, and searching for new ideas for application to his research!

It is not surprising to observe from this Georgia work that the pigs did better on the 18% protein rations than on the 14% rations in dry lot, for the first 42 days of the trial, even though there was no appreciable difference for the results over the entire 94-day experimental period. The same results would probably have been observed if only 16% had been used during the first 42 days of the trial. Many workers have determined that 16% protein is desirable and ample for hogs on drylot for the period from 40 to 110 lb. liveweight. Among the recent work confirming this are the extensive trials conducted at the University of Illinois and at Purdue during the past several years. In fact, there is evidence from certain experiments that less protein than this can be fed if particular care is taken to insure adequate vitamin, mineral and amino acid intakes.

Most feed manufacturers undoubtedly would prefer to play it safe, however, and furnish the hogs with approximately 16% protein for this period. Of course, if the hogs are on good pasture, the protein requirements can be reduced approximately 2 to 3%.

In this experiment either 5 or 10% tallow was added to certain rations. Several experiment stations have previously reported on the ad-

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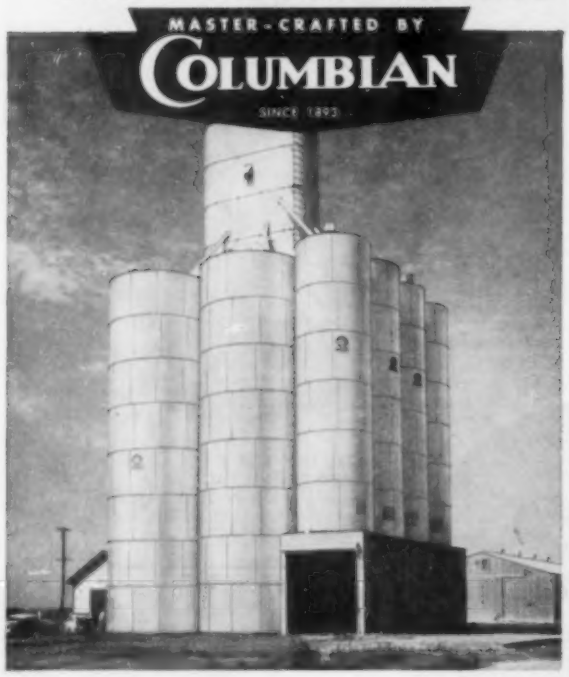

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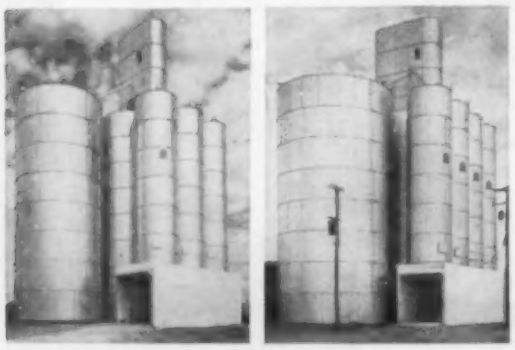

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ditions of fat to hog rations including those of Cornell, California, Florida, McGill University, North Carolina, West Virginia and others. In general, the same effects were observed in most of the reported work—improved feed efficiency and improved gains, especially if the fat additions were made at the expense of corn or other grain and the rations were not isocaloric. Most of the work so far reported with fat additions to the diet has resulted in significantly increased backfat thickness, contrary to the Georgia report. Likely the type of ration used has some bearing on the development of backfat reported—most of the workers so far have used corn or grain-soybean meal-animal protein type rations while the Georgia group used all vegetable protein rations. A recent Wisconsin report (1957), for example, demonstrated that corn gluten meal or peanut meal is conducive to fat-type carcasses, while meat scraps, dry milk and soybean meal all improve the leanness of the carcass, loin and ham. It is much more likely that the Georgia group would have demonstrated a greater difference in the effect of fat on backfat thickness if they had included some animal protein sources in their rations.

This is also not the first report of a growth depression resulting from supplementary lysine in hog rations. The Georgia workers have previously reported this effect (1955) in soybean oil meal-degossypolized cottonseed meal rations. Arkansas researchers (1955) also have reported a similar depression in corn-cottonseed meal rations for young pigs. Although from a strictly theoretical standpoint supplementary lysine might at first seem to be of benefit, the results to date do not seem to indicate this is true in all cases. Amino acid imbalances are not simple; overabundance of certain ones may be just as detrimental as undersupplies of others.

●

The Effect of Supplemental Vitamin D in Rations for Pigs Fed in the Absence of Direct Sunlight

● R. C. Wahlstrom and D. E. Stolte, South Dakota Agricultural Experiment Station; Journal of Animal Science, Vol. 17, No. 3, August, 1958, pp. 699-705.

ABSTRACT

Three experiments were conducted to obtain further information on the influence of supplemental vitamin D, calcium-to-phosphorus ratios, antibiotics and method of feeding calcium and phosphorus supplements in rations for pigs from weaning to market in the absence of sunlight.

Experiment 1. Twenty-four weanling pigs of various breeds (Duroc, Poland China and Spotted Poland China) averaging approximately 33 lb. were divided into six experimental groups of four pigs each. Four of the lots were confined indoors, while two lots had access to an outside runway. The basal ration was a corn-soybean meal-tankage type containing 0.8% ground limestone and 5.2% tankage (60% protein). The rations were self-fed.

The experimental variables were:

Lot 1—Control.

Lot 2—Additional vitamin D, 90 U.S.P. units per pound of ration in the form of irradiated yeast.

Lot 3—Additional antibiotics, chlortetracycline at a level of 10 grams per ton of ration.

Lot 4—Additional antibiotic and vitamin D as above.

Lot 5—Exposure to sunlight.

Lot 6—Exposure to sunlight plus additional vitamin D.

The results indicated that there was no statistical difference in rate of gain between the treatments. As the fastest gaining animal in each lot reached market weight, it was removed and slaughtered. The pigs receiving antibiotics gained approximately 6% faster than the controls. Those receiving supplementary vitamin D in the form of irradiated yeast consumed more feed, probably due to

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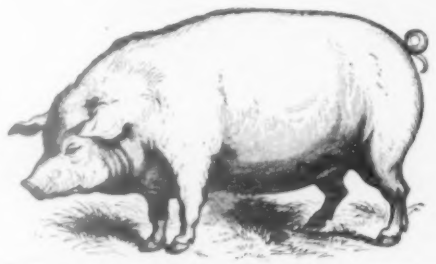

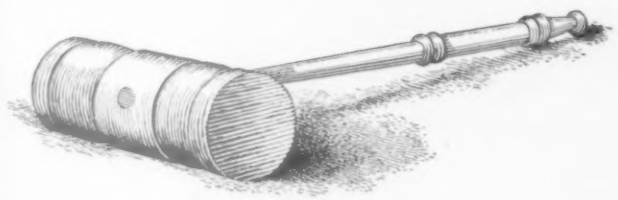

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improvement in appetite. Femur analyses were conducted on two pigs from each lot. Increased bone strength was observed when the pigs were allowed access to sunlight. No rickets were observed in any of the experimental animals.

Experiment 2. The basal ration in this trial was the same as in the first one, except that all rations included 10 grams per ton of chlortetracycline and 80 grams per ton of zinc carbonate. Two replicates each of 24 fall-farrowed pigs (Duroc, Hampshire and Spotted Poland China) averaging 36.5 lb. were assigned to six treatments as follows:

Lot 1—No vitamin D, calcium-to-phosphorus ratio of 1.8:1.

Lot 2—No vitamin D, calcium-to-phosphorus ratio of 2.3:1, achieved by increasing the level of ground limestone.

Lot 3—No vitamin D, calcium-to-phosphorus ratio of 2.5:1.

Lot 4—Vitamin D (90 U.S.P. units per pound of ration), Ca:P ratio, 1.8:1.

Lot 5—Vitamin D, Ca:P ratio, 2.3:1.

Lot 6—Vitamin D, Ca:P ratio, 2.5:1.

The average daily gains among all groups were extremely uniform, only varying between 1.80 and 1.86 lb. daily, on these confined pigs. The levels of blood calcium and inorganic phosphorus also did not vary significantly among treatments, although the pigs on the widest Ca:P ration with no vitamin D were low in blood phosphorus. Bone analysis also indicated little difference between variables.

Experiment 3. Eight pigs from each of four breeds (Duroc, Hampshire, Poland China and Spotted Poland China) were divided into outcome groups of four pigs each. A corn-soybean meal basal ration was used. Lots 1 and 2 received a complete mixed ration, while Lots 3 and 4 received their mineral supplement free-choice (equal parts of ground limestone, steamed bonemeal and trace mineral salt). Vitamin D was added (90 U.S.P. units per pound of ration) to lots 2 and 4. All lots were confined to inside concrete pens, but had had access to sunlight from 5 to 7 weeks prior to weaning.

The analysis of the results showed that those pigs receiving the complete mixed ration made rapid and efficient gains regardless of vitamin D supplementation, while those receiving the corn-soybean meal ration with a mineral supplement fed free choice, showed very poor growth and rickets in five of the eight pigs. Adding vitamin D to this ration resulted in some improvement in gain but did not give complete protection against rickets, since two of the eight pigs developed the condition. Approximately 2 to 2.5 lb. of mineral supplement were consumed per pig during the feeding period of approximately 95 days. This consumption did not provide adequate calcium consumption for the pigs since, on the basis of ration and free-choice mineral consumption, the pigs were on a ration containing approximately 0.2% calcium and 0.37% phosphorus, considerably below the NRC recommendations for growing pigs.

COMMENT

This work supplements the swine work conducted several years ago by Bethke and associates (1946) at the Ohio station on the requirements for vitamin D. Bethke suggested that the minimum practical vitamin D requirement was 90 U.S.P. units per pound of ration for growing pigs fed a ration containing 0.6% calcium and 0.45% phosphorus. The minimum requirement observed by Bethke in five trials varied between 44 and 90 U.S.P. units per pound of ration. The variation was suggested to be due to the storage of vitamin D, and the fact that dark pigmented pigs developed symptoms of rickets first or more severely.

The South Dakota work is extremely interesting since it indicates that pigs with adequate storage levels of vitamin D can be raised satisfactorily in confinement without supplementary vitamin D in the ration. Vitamin D is very cheap, and feed manufacturers would be extremely unwise in reducing the amount in feeds below the commonly accepted 90 U.S.P. level for growing pigs in view of the fact that vitamin D storage levels are variable.

The work reported above also points out that free-choice feeding of mineral supplements to hogs as the chief means of supplying calcium to a ration can be an extremely dangerous practice.

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Not Planning Special Fall Beef Feed Booking

RICHMOND, VA.—Southern States Cooperative, Richmond, announced to its patrons recently that it is not planning any special beef feed booking program for this fall.

Such a program does not seem practical because of the market and supply outlook on high protein oil meals, which make up a large part of Southern States beef feed formulas, according to Service Guide, a publication of the cooperative.

"Increased farm storage capacity for soybeans during the last several years, as well as fluctuations in the soybean and cottonseed oil markets, have changed the price pattern," the publication said. "To a large extent, this has eliminated much of the price decline that formerly was common at harvest time.

"The large crop outlook this year indicates there will be little or no advantage to forward buying on the part of mills," the report continued. "It is felt that regular Service Guide prices throughout the fall period will give patrons as good or better buys on their beef feed requirements as any booking price that might be announced early in the fall period."

NO PULLORUM REACTORS

SALEM, ORE.—Not a single pullorum reactor was found in the Oregon birds tested under the 1957-58 turkey improvement program. This is the second time in three years that all birds have been free of this disease. During the year, 231,000 birds representing 173 flocks participated in the program. The 21 hatcheries under the plan had a combined capacity of 2.5 million birds.

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SPECIAL DESIGN—The broiler house designed by W. O. Reece and built by R. E. Pennington in central Georgia is 252x35 ft. and is basically of the pole type. It is open all around but closely screened. Full-length ventilators provide maximum flow of air, while long eaves, extending 36 in., cut down on drafts and direct sunlight, and help keep out rain.

Unique Equipment, House Design Used in Broiler Operation

A broiler operator tells how he proved broilers can be raised at a profit in central Georgia

Equipment designed in a living room and built in the home workshop made Jones County, in the middle of Georgia, a "commercial broiler county."

W. O. Reece, a native of Cherokee County, where the industry was born before World War II, started in the poultry business hauling live broilers from Canton, Ga., to retailers in Macon, Ga., when he returned from service. Between trips, he started a small flock of 1,200 broilers at his new home near Gray, but was told by the "experts" that broilers could not be raised in "middle Georgia" because of the climate.

Far from discouraged, Mr. Reece finally secured a feed dealership and started to raise broilers on contract.

One of his first growers was Albert Bachelor, a railroad mechanic who contrived some unusual, but highly efficient equipment.

Among the "Goldberg inventions," which have been adapted to almost all of the 40-odd growers now working with Mr. Reece, is a flowing waterer.

A simple angle iron is suspended from the roof by wire cables rigged to a ratchet at one end of the house. Each of the waterers, running the full length of the house, is controlled by the same ratchet, thus making it possible to raise all the waterers at the same time with a "simple twist of the wrist."

At the end of the house, the water drains outside. By adjusting the taps, the flow of water is steady but controlled, and as a result the broilers have fresh water at all times.

Second phase in the water system is a small platform on each side of the waterer. As the birds jump up to get water, they actually "wipe their feet" on the boards and thus prevent dirtying the water. The boards are easily cleaned between flocks.

A "thermostat" from an old oil heater is rigged to the waterer to allow addition of antibiotics or medications. By adjusting the "thermostat" the amount of the additive can be accurately controlled.

Use of kerosene, when the birds show signs of the "sniffles," with this "thermostatic control" has cut down on respiratory troubles, Mr. Reece claims.

The Reece management program is based on a study of individual problems, the use of new ideas which are flexible enough to allow adjustment in individual cases, and the theory that in raising broilers, "if you don't move ahead you don't stand still, you fall behind."

When Mr. Reece started feeding broilers with growers, most of the flocks were 3,000 size, later they were expanded to 6,000, and future plants are being built for 10,000-bird flocks.

Based on this plan, Mr. Reece designed his "ideal" broiler house, and the first was built by R. E. Pennington, near Haddock, Ga.

FIRST HOUSE—R. E. Pennington (left), Haddock, Ga., built the first "ideal" broiler house as designed by W. O. Reece (right), to produce broilers under Mr. Reece's operation in central Georgia.

BIGGER FLOCKS—W. O. Reece's broiler operation in Georgia started with flocks of 3,000 birds, was expanded to 6,000, and plans are now being carried out to grow broilers in 10,000-bird flocks.

The house is 252 x 35 ft. and is basically of the pole-type, open all around but closely screened. Full length ventilators provide maximum flow of air, while long eaves, extending 36 in., cut down on drafts and direct sunlight, and help prevent driving rains from entering the houses.

Felt strips, attached to 8-ft. poles, are placed horizontally and serve as "top" and "bottom" of the sides. Each can be raised or lowered individually, but are arranged with rope controls so that several can be handled at the same time.

How well this simple and inexpensive system works is indicated by the fact that during the baby blizzards last winter, growers lost surprisingly few birds through freezing or lack of heat.

Mr. Reece said his growers averaged, over a period of several years, a 3.50-lb. bird on a 2.5 feed conversion in less than nine weeks.

"Actually, we're about a week ahead of north Georgia," he said. "Most of our birds go to market when they weigh around 3.5 lb. We have been getting this average in from eight weeks, three days, to a full nine weeks. Unless we run into trouble, we seldom feed birds more than nine weeks."

Grower Contracts

The Reece contract with his growers is simple and highly satisfactory to them. So much so, he said, that he has a "waiting list" when, and if, he decides to step up production.

CLEAN WATERERS — Small board platforms are built on each side of the waterers in the houses of W. O. Reece's broiler operation in central Georgia. As the birds jump up to get water, they "wipe their feet" on the boards, and thus prevent dirtying the water.

The grower furnishes the house and the equipment, all in accordance with Mr. Reece's standards. The grower also pays all operating costs, including heat, light and water. In return he is guaranteed 2¢ lb.

Mr. Reece furnishes the chicks, feed and medications, and also stands the cost of catching and cooping the grown birds. The feed and other supplies are billed out at a retail cost at the time of delivery, and all actual costs are carefully computed by Mr. Reece and the grower. Any additional profits, above actual costs, go to the grower, meaning that on the average, a grower makes around 10¢ a bird.

Expansion will come when market conditions warrant, since Mr. Reece said he does not believe in starting a batch of broilers without knowing where he can sell them when they are grown. Most of his production is sold under contract to a processor in north Georgia, as the retail market in Macon can no longer absorb his production.

Careful Planning

"You can't be in and out of the broiler business like you turn on a water tap," Mr. Reece said. "We plan every step, all the way, before we ever place the order for baby chicks with the hatchery. When I say 'we,' I mean the grower and myself; that way, we all know what we are doing and we eliminate the misunderstandings. We cut leaks which mean losses, as we are all in this business to make some money."

FELT SIDES—One of the features of the poultry houses in W. O. Reece's broiler operation in central Georgia are felt strips, attached to 8-ft. poles, serving as "top" and "bottom" of the sides of the house.

Iowa Workers Study Role of Enzymes in Nutrition of Baby Pigs

AMES, IOWA—A report summarizing current research on enzymes for baby pigs was released in a recent issue of Iowa Farm Science, publication of the Iowa Agricultural Experiment Station at Ames.

The report discusses a series of tests conducted by Dr. Damon Catron, swine nutritionist at the station, and others on the experiment station staff.

Several approaches are used in this research, the report said. Most frequently used is supplementation of basic rations with various levels of proteolytic enzymes from animal, plant, bacterial and fungal sources and the observation of effects on rate of gain and feed conversion. Accumulated research to date demonstrates about a 6% improvement in rate of gain and a 3% improvement in feed efficiency from enzyme supplementation of plant protein diets, the report said.

Another approach involves sacrificing pigs at intervals from birth to eight weeks and examining the digestive organs and their contents for enzymes. The organs of market hogs are also studied and evaluated in this approach, the report said.

In other experiments, nutritionists are using the "test-tube" method to simulate natural conditions existing in the baby pig. This makes possible the quick, economic screening of various bacterial and fungal enzymes, which are emphasized for baby pig diet supplementation because of their low cost, according to the report. Animal enzymes are included for comparative purposes.

Using this method, scientists can determine the approximate levels of various enzymes needed to obtain the best response from baby pig diets.

Past studies point up that baby pigs have deficiencies of digestive enzymes needed to handle diets of common feed ingredients, especially vegetable proteins, the report said. This problem will be studied further, with the primary objective of improving utilization of soybean meal and other plant proteins in baby pig rations.

The report states that more knowledge is needed of physiological conditions in the pig which may limit its ability to digest ingredients and to benefit from enzyme supplementation.

Also working on these studies are P. A. Hartman, E. A. Hewitt, V. C. Speer, V. W. Hays, C. C. Culbertson and L. E. Johnson.

FIRM ANNOUNCES HOG PROGRAM—Valley Mills, Vicksburg, Miss., is promoting a "pork factory" program of feeding on concrete. Above is one of the company's units. It is divided into four pens designed to house 20 hogs each, from weaning to market. The program is known officially as the Grade A 90-Day Pork Factory.

Firm Announces Pig Factory Plan

VICKSBURG, MISS.—Valley Mills, Vicksburg, has announced a new program for feeding swine in confinement. The plan is designated the Grade A 90-Day Pork Factory.

The program has been outlined in a folder which includes ideas for breeding meat type hogs desirable for confinement feeding, building plans, materials list, construction suggestions and feeding programs.

The building plan outlines a concrete-floored structure that is economical to build and which can be operated with a minimum of labor. It is divided into four pens designed to house 20 hogs each, from weaning to market—a total of 80 hogs for each unit. Plans allow for extending the house for increased hogs in units of 20.

According to the announcement of the plan, the program will make it possible to produce pork at a lower cost, with less labor, with reduced disease problems and a more regular farm income with four market hog crops annually. Feeding four crops will give the farmer a cash income every three months with increased opportunities to hit a higher market.

Iowa Scientists Report On Nutrition Factors In Early Chick Growth

AMES, IOWA — Nutrition factors involved in early chick growth are being studied in basic and practical experiments under way at Iowa Agricultural Experiment Station in Ames.

The studies were discussed in a recent issue of Iowa Farm Science, a publication of the experiment station.

Studies with New Hampshire chicks fed purified diets are being conducted to learn the amino acid requirements of chicks. The arginine requirement for optimum growth and feather development proved to be about 1.6%, and the lysine requirement 1%. Birds fed diets either too high or too low in these two amino acids grew less rapidly and developed severely abnormal feathers.

Also tested were two synthetic estrogens for their effect on the growth rate of broilers up to six and eight weeks of age. The materials were tested at levels up to 15 milligrams per pound in practical diets. Their effect on feed efficiency was negligible, the report said. But both estrogens, as judged by preliminary trials, seem to cause a sizable increase in carcass fat and yield of higher grade carcasses.

Several varieties of grain sorghum were included in diets of young chickens at various levels by substituting the sorghum for corn. In five experiments involving over 1,000 chicks, each of the grain sorghum varieties has proven about equal to corn when used in the test to replace half the corn used in a standard starter diet, researchers report.

California Cattlemen's Convention Plans Told

SAN FRANCISCO—The 42nd annual convention of the California Cattlemen Assn. will be held at the Flamingo Motel, Santa Rosa, Dec. 5-6, reports Edgar Dick, secretary.

Included among the topics for discussion will be an address by Dr. Herrell DeGraff, director of the fact finding committee of the American National Cattlemens Assn., who will give the highlights of the results of research programs launched by his committee. These will include research programs on grading, beef imports, livestock integration, and various phases of the retail and packing industries.

Dr. R. Hill, in charge of Armour & Co.'s beef research program in Colorado, will discuss the search for a fast-gaining lean-type animal. Dave Pettus, director of the livestock division of the U.S. Department of Agriculture, Washington, D.C., will talk on the cattle outlook.

Dr. George Mehren, director of the Giannini Foundation at the University of California, Berkeley, will talk on "Integration of the Livestock Industry." President Jack Milburn of the American National will present the national story.

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FEEDSTUFFS

LEADER IN THE FIELD

MANAGEMENT

(Continued from page 16)

ably be wise to give no artificial light during the growing period and, except for pullets coming into lay during the months of September through December, to provide no artificial light until the birds are in 50% production, then increase the light by 15 minutes per week until they are receiving 13½ hours of light per day.

PULLET GROWING PROGRAMS: Sooner or later, most cage operators debate whether it is better to raise their own pullets or buy them from a specialized pullet grower. Each system has its advantages and disadvantages, and for a given cage egg producer, the one best adapted to his needs may change depending on the price and quality of pullets available from specialized sources and his own time, houses and equipment.

In raising replacement pullets to keep mortality from leucosis at a minimum, the pullets should be brooded and grown as far away from adult birds as possible with the least possible amount of traffic between them. For a specialized pullet grower, birds of different ages should not be kept in the same house. Smaller houses with an all in, all out program are decidedly preferable to a large house where sales volume necessitates more than one age in the same house.

Much concern has been expressed recently about the desirability of using a "restriction" program for growing replacement pullets. This restriction to date has been limited to (1) light, which has been previously discussed, and (2) nutritional. Nutritional restriction has been attempted in three ways: (a) by using high fiber levels in the growing ration, (b) by feeding less total feed than the bird would normally consume if given free access to an unlimited amount of the ration, and (c) a combination of high fiber and limited feed. This work is so new that sufficient data are not available to establish whether these programs are superior to the older and more conventional pullet growing programs.

Claimed advantages of these restriction programs include: (1) delayed sexual maturity, (2) fewer small eggs, (3) peaking at a higher level of production, (4) slower rate of decline from the peak of production, (5) lower mortality during the laying period, and (6) a cheaper growing feed and possibly a lower feed cost for producing a pullet to the beginning of egg production. In Table 2 are given the data we have to date on these claimed advantages of nutritional restriction of growing pullets.

RATIONS AND FEEDING PROGRAMS: Almost exclusively, caged layers are being fed a complete all-mash type of feed today. The necessary protein level would depend upon the balance or quality of the protein sources used. Most nutritionists prefer a level of approximately 17% protein in a low fiber cage layer ration.

If fat is used in a cage formula, it is usually used at a low level of 1% to 3% to improve physical condition of the feed, reduce dustiness, and save loss of feed from wind currents and excessive beaking of the birds. There is little evidence to indicate that this level of fat improves rate of production or feed efficiency. Most caged layer formulas include adequate levels of calcium (2.50%) so that no added oyster shell or calcium source is fed. The mash and grain feeding system is rarely ever used in cage plants. When an all mash is used, added grit is not considered necessary. Particularly during periods of stress, multiple daily additions or stirring of the feed will help to offset the stress and maintain the level of production. More and more cage operators are going over to mechanical feeders with larger and deeper troughs in order to make use of the savings effected by bulk feed delivery.

FATTY LIVER SYNDROME: A new type of problem has been described which has been charged with the responsibility for considerable death losses in laying birds. Such losses, though not restricted to cages, have been more prevalent in caged layers and, in general, seem also to be related to the calorie value of the ration. This condition is referred to as the "Fatty liver syndrome," and it is characterized by a rapid increase in body weight, a decline in egg production and an increased rate of mortality. On post mortem, excessive abdominal fat, fatty livers, capillary hemorrhages in the liver and hematomas are often found.

Too little is known about the cause, prevention or cure of this condition at the present time. Considerable research is in progress and answers should be found in the near future. At the present time it is known that

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choline vitamin B_{12} and vitamin E are associated with normal fat metabolism and shotgun recommendations suggest the addition of 12 mg. B_{12}, 5,000 to 10,000 IU Vitamin E and 500 to 1,000 gm. choline per ton of cage ration. Some nutritionists believe that a 17 to 18% level of protein and the addition of ¼ to ½ lb. of methionine per ton of feed would be beneficial both for prevention and cure of the syndrome.

NUMBER OF BIRDS PER CAGE: Considerable difference of opinion exists as to the most profitable number of birds per cage. Early in the growth in popularity of cages, the general practice was to have one bird per cage. Due to the increased housing and labor costs, efforts have been made constantly to increase the number of birds housed per unit.

The most recent popular trend has been toward the attempted use of the so-called colony cage. The common practice is to put from 25 to 40 birds in each of these. The most popular sizes are 3 by 5 ft. and 4 by 8 ft. This type of cage reduces the housing cost per bird to almost one half that of the individual cage, reduces labor costs and encourages the use of mechanical feeders, bulk feed delivery and other cost cutting practices.

Research that has been done comparing two birds with one bird per cage in general has shown about the same net income for each. The more birds per cage, the more acute the managament problems become. Not enough research has been done on colony cages to establish their place in cage egg production. For those who have them in use, should production, picking or fly control problems develop, perhaps reducing the number of birds per cage and giving more floor, water and feeder space per bird will relieve or remove the problem. The writer continues to prefer the individual bird per cage over the other systems.

TEMPERATURE CONTROL: One of the new methods of artificially cooling poultry houses in the Texas area involves the use of a large exhaust fan at one end of the house and a large excelsior pad with water constantly recirculated over it at the other end of the house. The house must be fairly tightly closed for this method to work and this reduces the flexibility of ventilation and cooling in the times of intermediate environmental temperatures. This method, however, reduces the temperature 10 to 15° in the house and has given considerable promise in tests to date.

Cost of operating the system is sufficient to require a measurable increase in performance to justify its use. Fogger nozzles are used by many cage operators. They will save the lives of many birds on hot days and are much cheaper to operate than the pad and fan system. Foggers do not lower the temperature nor have as favorable an effect on performance as the pad and fan systems.

VACCINATION AND DISEASE CONTROL: There are many satisfactory vaccination programs in use today. At the Texas A&M College our caged layers are vaccinated for Newcastle at four days of age using the water method and the B_1 strain of virus. At four weeks, a combination of Newcastle and bronchitis vaccine is used and at 8 to 12 weeks the birds are vaccinated for fowl pox using the wing-web stab method. At about 4½ to 5 months the birds are individually vaccinated intralocularly with a B_1 strain of Newcastle virus as the birds are moved to the cages.

FLY CONTROL: The old recommendations concerning use of litter below the cages to get the dropping cones started, well ventilated houses, avoidance of water spillage or overflow, and use of well balanced rations are as important as ever in fly control.

Use of the insecticide malathion, 1% to 2% in kerosene or the old standby DDT, 1% to 2% kerosene sprayed thoroughly and consistently over the droppings once or twice weekly, will control most cases of fly breeding. Some prefer to use diazonium mixed with Fuller's earth or other drying agent. Polybor 3 sparingly dusted over the droppings is an effective larvacide.

Research is under way to develop a good larvacide that will be nontoxic to the bird and to man but which may be included in the feed for killing the fly larvae in the droppings.

SUMMARY: Since the beginning of the rapid growth in popularity of cages in the South, many changes have been made in growing replacements and management during the laying period. Many of these changes have resulted in progress. Today, laying cages are on the threshold of a new era. What happens to them in large measure depends upon new discoveries in breeding, nutrition, disease control, housing and mechanization and how these developments are utilized through their synchronization into an ever-improving cage management program.

TABLE 2. Effects of Nutritional Restriction of Growing Pullets on Their Laying House Performance

Growing period treatment	Feed consumed to 24 wks.	Age to 1st egg	Egg size at 50% Prod.	Egg size for 1st 3 mos.	—Hen Day Prod.— Pre. Prd. 8/22-9/23	1st 3 Prds.	—Feed/Doz.— Pre. Prd. 8/22-9/23	1st 3 Prds.	Mort. 8 mos.
	lb.	days		gms.					%
Pullets and oats	17.3	150	49.8	57.6	64.6	79.1	4.09	3.91	0
Pullets and milo	16.5	157	49.1	57.0	52.2	81.1	5.15	3.81	0
All-mash	18.9	147	49.7	57.9	70.0	78.1	3.86	3.86	0
All-mash (70%)	14.7	144	49.6	57.1	55.1	79.1	4.35	3.81	7.5
Basal + 6% fiber (alfalfa)	19.6	151	49.4	57.6	71.9	77.0	3.87	3.97	2.5
Basal + 6% fiber (alfalfa) 70%	16.0	168	49.3	59.1	36.3	74.3	6.92	4.11	5.0
Basal + 6% fiber (cane litter)	19.4	169	50.2	58.9	50.1	75.2	5.00	4.06	7.5
Basal + 6% fiber (cane litter) 70%	16.3	176	(?)	58.8	25.8	74.6	9.60	4.11	0
Basal + 6% fiber (oat hulls)	20.0	154	50.0	59.1	62.7	74.1	4.04	4.05	2.5
Basal + 6% fiber (oat hulls) 70%	16.7	157	49.9	57.9	42.1	79.7	5.98	3.76	0
Basal + 5% fat	19.0	144	50.0	59.3	65.1	76.9	3.90	3.82	7.5
Basal + 5% fat 70%	14.4	143	48.0	57.2	59.0	80.0	4.23	3.67	5.0

OREGON TURKEY MEETING

SALEM, ORE.—The annual fall outlook meeting of the Oregon Turkey Improvement Assn. is scheduled here at the Marion Hotel Nov. 28, starting at 7:30 p.m. The program will include talks on the general business situation, outlook for hatching eggs, poults and market turkeys, and a panel discussion of hatcherymen, processors and growers.

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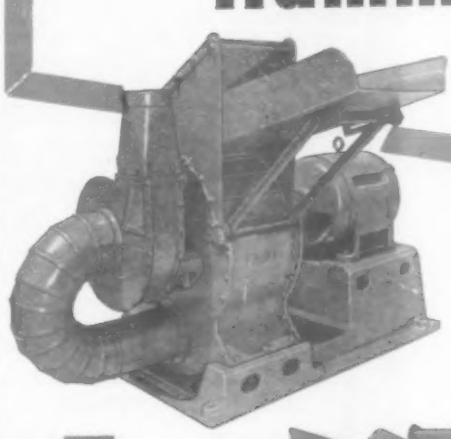

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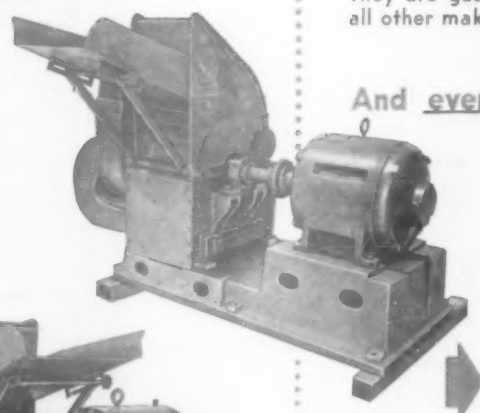

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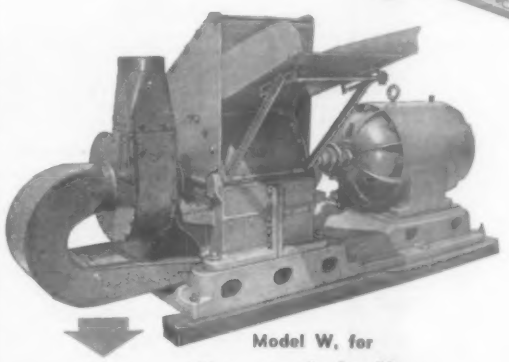

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Classified advertisements received by Tuesday each week will be inserted for the issue of the following Saturday. Rates: 15¢ per word; minimum charge $2.25. Situations wanted, 10¢ a word; $1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of $10.50 per column inch. All Want Ads cash with order.

HELP WANTED

MEDIUM SIZE FEED PROCESSOR DEsires high caliber salesman to sell feed ingredients in Southeast to feed mills. Permanent and excellent position. In reply state qualifications and income required to start. Address Ad No. 4209, Feedstuffs, Minneapolis 40, Minn.

BASIC MANUFACTURER OF POULTRY pharmaceutical and nutritional products desires Delmarva representative. All replies confidential. Write Ad No. 4234, Feedstuffs, Minneapolis 40, Minn., listing full personal information and qualifications in first reply. College graduate preferred.

LEADING MANUFACTURER OF FEED and fertilizer needs a salesman in the Iowa City area. This outstanding opportunity offers high commissions, home nights, paid vacations, complete line of accepted products, your own boss. Feed or fertilizer sales experience necessary. Call or write Me-Jon Fertilizer, Inc., Oxford, Iowa.

TERRITORY MANAGER WANTED — WE are looking for a man who can sell both in the country and at dealer level. East central Kansas territory. Must have following and is now or has recently been active in formula feed sales. Salary, bonus, car allowance, expenses. Contact Sales Manager, Quisenberry Mills, Inc., 8521 Prospect, Kansas City, Mo.

MAN TO MANAGE EXPORT DEPARTment for large feed company. Principal export business in Latin America and Europe. Desire man 30-45 with five or more years in export business. Knowledge of feed and concentrate business and ability to speak Spanish are desirable. Salary open. Give full particulars. All replies held in confidence. Address Ad No. 4245, Feedstuffs, Minneapolis 40, Minn.

WANTED
EXPERIENCED SALESMEN

Full time or sideline for textile bags, both new and reconditioned. Salary commensurate with ability. All replies confidential. Contact

GENERAL BAG & BURLAP CO.
3435 Melvale Street
Philadelphia 34, Penna.

Sales Training Supervisor

Nationally prominent Feed Manufacturer has need of a Sales Training and Dealer Development Supervisor. Prefer age 30 to 40. Should be college trained with agricultural background and experience in the feed business. Ability to create, organize and promote dealer marketing programs. Will headquarter in Chicago. Travel is required. Send complete resume to ad No. 4236, Feedstuffs, Minneapolis 40, Minn.

HELP WANTED

SALES MANAGER WANTED FOR MIDwest feed mill. Prefer recent college graduate with feed sales background. Excellent opportunity. Address replies to Ad No. 4227, Feedstuffs, Minneapolis 40, Minn.

EXCELLENT SIDE-LINE OR FULL TIME item for salesman selling to feed, grain, farm equipment dealers and farmers. Liberal commissions. Replies will be held confidential. Write Doane Agricultural Service, Inc., St. Louis 3, Mo.

MACHINERY FOR SALE

WHIRLAWAY AIRBLAST CAR LOADERS, cast iron pulleys, new and used feed and elevator equipment. Hagan Mill Machinery, P. O. Box 574, Jeffreson City, Mo.

FOR SALE—ENCLOSED MOTORS; RICHardson Scales; truck scales; hammermills; oat crimpers; horizontal and upright feed mixers; sewing machines; elevator legs; screw conveyors; molasses mixers and pellet mills. J. E. Hagan Mill Machinery, Box 574, Jefferson City, Mo.

FEED MIXER, 1-TON CAPACITY, GUARanteed first-class throughout, 5 H.P. motor drive. Address Ad No. 3479, Feedstuffs, Minneapolis 40, Minn.

ALFALFA DEHYDRATING PLANT, LATE model Heil, bargain price. Address Ad No. 4235, Feedstuffs, Minneapolis 40, Minn.

CALIFORNIA PELLET MILL—NO ELECtrical. Priced for quick sale. Contact: Phil Anderson, Park Drive, Muscatine, Iowa.

PELLET MILLS, 50 H.P. CALIFORNIA, with coolers and crumblizer; also Richardson Bagging Scales, animal fats tanks and molasses units. Ray Jones, Box 326, Benton, Ill.

PNEUMATIC "AIR-CONVEYOR" SYSTEMS —Vacuum and Hi-Pressure. Any size or product. Sell or lease, new or used. Also "Do-It-Ur-Self" Bulk Truck Kit, $1,495. Nolder Co., Box 14, Corona Del Mar, Cal.

FOR SALE—1955 MODEL DAFFIN PORTable feed mill mounted on two-ton Ford truck. Been used very little. Truck and mill in very good condition. Priced to sell. Terms. Taylor Feed Co., Albertville, Ala.

COMPLETE EQUIPMENT FOR GRINDING suncured alfalfa meal. 224 Fox chopper; totally enclosed 50 H.P. with new dry starter; JB 4W grinder with 75 H.P.; packer with 7½ H.P. motor. All in good condition, ready for immediate operation. J. F. Brady Co., Atkinson, Neb.

FIVE USED S. HOWES NO. 2 CORN CUTters, in good condition. Also used knives (36 rotary and 20 bed). Three used S. Howes No. 1 corn cutters, in good condition. Also used knives (31 rotary and 50 bed). Located at our Albany, N. Y., plant. Open to any reasonable offer. Cooperative Grange League Federation Exchange, Inc., P. O. Box 973, Buffalo 5, N. Y.

SALE — ALUMINUM TANKS, 4,000 GAL., 2,100 gal.; Spiral Ribbon Mixers 200, 75 cu. ft.; Dewatering presses: Davenport No. 1A, No. 2A, No. 3A, Louisville 5-roll 36"; six Louisville Rotary Steam Tube Dryers 6'x50', 6'x30', 6'x25'; screw conveyor, trough belt conveyor, bucket elevator, bins, etc. Perry, 1403 N. 6th St., Philadelphia 23, Pa.

MACHINERY FOR SALE

FOR SALE—NEW AND RECONDITIONED Richardson, Burrows, O K and Fairbanks bagging scales; Union Special, Minneapolis and Wilcox & Gibbs sewing heads; Whizzer bagging conveyors, bins, motors and mixers; also, engineering service. Winborns' Milling Equipment Service, Williamsburg, Iowa.

SIDNEY NO. 347 SEED AND GRAIN cleaner with 40 screens, 9x18 three pair high roll; Blue Streak 6-A-C hammer mill with crusher-feeder, 75 H.P. direct connected motor; Calking 8-30 slurry treater; Gibson oat crusher, 85 bu. capacity. Write Ad No. 4250, Feedstuffs, Minneapolis 40, Minn.

RICHARDSON AUTOMATIC SCALES — One G-100 with G-72 air shaker. One G-50 all electrically operated. Two Schutte 47 Hammermills. One Wee Scott Titus 36 H.P. high pressure boiler. One York Shipley 15 H.P. low pressure package boiler. Union Special 80600 sewing machines. No. 7 all-steel Snappy shaker. Bar-Nun sifter. Dravers 2,000 and 1,000 lb. Dial Hopper scales, etc. Honegger-Hanley Mills, Inc., Mansfield, Ohio.

REBUILT NO. 7 ACP BLUE STREAK mill for use with 100 H.P. motor; Burton ton size horizontal mixer with TEFC motor; No. 7 AC used Blue Streak mill; this equipment available immediately; can give delivery soon on No. 6AC rebuilt Blue Streak mill for use with 75 H.P. motor; 36" used Diamond Huller attrition mill with two 50 H.P. open motors, 220 V. with blower system, dust collector, 20 H.P. TEFC motor. Phone or write Wadington Feed Mill Supplies, 2300 4th Ave. S.E., Cedar Rapids, Iowa.

MACHINERY WANTED

ALL KINDS OF GOOD USED GRAIN processing machinery. E. H. Beer & Co., Inc., Baltimore 2, Md.

WANTED—USED PELLET MACHINE IN good condition. Request full information. Address replies to Ad No. 4210, Feedstuffs, Minneapolis 40, Minn.

WANTED TO BUY — RICHARDSON scales, bag closing machines and other good mill, feed and elevator equipment. J. E. Hagan Mill Machinery, Jefferson City, Mo.

ROTARY DRYER, DIRECT FIRED, 8 FT. diameter, 30 ft. or longer. Also hammermill, 36 to 48 in. opening, complete with 100 to 150 H.P., 3-phase, 220-volt, 60-cycle, 1,800 R.P.M. motor and starter. Address Ad No. 4066, Feedstuffs, Minneapolis 40, Minn.

GOOD, USED ROSKAMP OAT HULLER and flaking unit, 200 BPH or more oat crimper, two upright grain driers of 300 BPH or more capacity. Late type voltage compensator motor starters 50 H.P. up. Address replies to Ad No. 4254, Feedstuffs, Minneapolis 40, Minn.

BUSINESS OPPORTUNITIES

FEED MILL — CALIFORNIA, ESTABlished many years. Must be sold due to ill health. Includes land, building and equipment for full operation. Price reduced to $78,500. Eay terms. Wigh-Gustafson Realty Co., 1515 Draper St., Kingsburg, Cal.

FOR SALE—WELL ESTABLISHED FEED and farm supply store. Opportunity for grain handling, room for lumber and building supplies. Railway siding, highway location. Ideal location for large distributor, grinding and mixing equipment and truck scales. Advanced age forces retirement. L. S. Russell, Cardington, Ohio.

WANTED

Brokers and agents selling feed ingredients interested in forming national association. Objectives: 1—Discussion of mutual problems; 2—Improving service in principals and customers; 3—Promoting use of brokers and agents as sales representatives. Reply: Ad No. 4253, Feedstuffs, 612 Board of Trade Bldg., Kansas City, Mo.

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and FEED MILLS
When you want to buy or
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MID-WEST BUSINESS EXCHANGE
Halbert C. Smith Plymouth, Ind.

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SITUATIONS WANTED

SERVICE — YOUNG, AGGRESSIVE, EXperienced veterinarian offers program to keep you on top in today's competition. Address Ad No. 4255, Feedstuffs, Minneapolis 40, Minn.

SALES AND SERVICEMAN WITH EXperience in sales, research, laboratory. B.S. in poultry husbandry and animal nutrition. Southern California preferred. Address Ad No. 4259, Feedstuffs, Minneapolis 40, Minn.

SALES MANAGER—15 YEARS' FEED EXperience; purchasing, milling, nutrition and disease, sales and sales management, ownership. Will relocate. Address Ad No. 4248, Feedstuffs, Suite 3214, 551 Fifth Ave., New York 17, N. Y.

NUTRITIONIST DESIRES POSITION IN feed industry or research, livestock or poultry, B.S., M.S. Some feedlot and ranch experience; college teaching. Age 30, married. Prefer Texas, California, Southwest. Consider other areas. Address replies to Ad No. 4249, Feedstuffs, Minneapolis 40, Minn.

SITUATIONS WANTED

TOP FEED SALESMAN SEEKS NEW POsition. Nine years' experience full line and broiler feed sales. Familiar with credits, freight, feeding programs, bulk grinding and mixing and broiler deals. Good dealer closer. Will move. Address Ad No. 4243, Feedstuffs, Minneapolis 40, Minn.

DOG FOOD SALESMAN DESIRES JOB with sound aggressive firm; mature and experienced; intimate knowledge of sales and promotion with Midwest following, professional, dealer, consumer field. Address reply to Ad No. 4242, Feedstuffs, Minneapolis 40, Minn.

PRODUCTION EXECUTIVE — MANAGER large feed manufacturing plant, administrator and coordinator, with ability to think and assume responsibility, seeks new position. Diversified background includes other lines and multiple plant experience. Well versed modern production techniques, labor relations, cost analysis, maintenance, personnel development, etc. Has ability to get along with people. Highly interested in end results. Address Ad No. 4223, Feedstuffs, Minneapolis 40, Minn.

FEED EXECUTIVE

Broad background in feed and feed supplements, sales management, advertising production and management, sales promotion, sales training, public relations. Fluent speaker, prolific writer. Will relocate. Address ad No. 4233 Feedstuffs, Suite 3214, 551 Fifth Avenue, New York 17, N. Y.

MISCELLANEOUS

SIMPLEX TIME CLOCK, TYPE B 3, MODel 787, $125; Marchant Calculator, Model B ADX, $350; Tag-Heppenstall Moisture Meter (2 rolls), $250; Steinlite Moisture Tester, Model S, $125. All very good condition. Baltimore Feed & Grain Co., 2341 Boston St., Baltimore 24, Md.

Canada Reports On Beef Cattle Testing Program

OTTAWA, ONT. — A performance testing program for beef cattle, based on the genetic principle that fast-gaining bulls will produce, on the average, fast-gaining progeny, has rounded out its second year of operation. Top quality calves in 44 Canadian purebred herds were identified through the record of performance system.

The program, carried out by the Canada Department of Agriculture and participating provinces, tested 863 calves—more than double the number in the preceding year. The total continues to increase as more provinces join in the project.

The idea for the program took root in 1955 when, at the urging of purebred cattle producers, a group of officials from the Federal Production Service and the Saskatchewan Department of Agriculture inspected northwestern U.S. projects.

Ultimate goal is to improve efficiency and economy of beef cattle production in Canada. There were 404 bull and 459 heifer calves on test to weaning. The bulls gained an average of 2 lb. per day and the heifers 1.7 lb. The top one third of the bulls put on 2.26 lb. per day, or 0.69 lb. more than the bottom one third. With the heifers, this difference amounted to just over ½ lb. per day.

Breeders weighed the test calves at birth, and provincial officials weighed and graded them at weaning and again at the end of the winter feeding period. A number were eliminated, and, during winter feeding, 349 bulls and 418 heifers were under scrutiny.

During this period, the bulls gained an average of 2 lb. per day and the heifers dropped to 1.3 lb. The top one third of the bulls tested 2.27 lb. per day, or 0.51 lb. more than the bottom one third. Difference in these two groups of heifers amounted to 0.41 lb. per day.

Given this information, it is a matter of personal decision on the part of the breeder of purebred stock to determine his selection of future breeding animals. The Canada Department of Agriculture suggests that producers of commercial stock may base their selection of bulls on a performance test.

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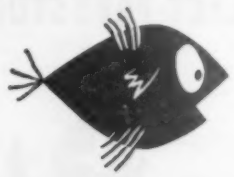

FEEDSTUFFS
Offers a lot to its readers..no catch to it. $5 a year brings 52 issues crammed full of information.

WINS SALESMANSHIP TROPHY—J. M. Flinn, left, president of the Blatchford Calf Meal Co., Waukegan, Ill., is shown presenting the annual Barwell Salesmanship Trophy to the 1958 winner, C. J. Kneale, district sales manager for Kansas, western Missouri, north Oklahoma and the Texas Panhandle. Looking on at right is Jack Sams, vice president and sales manager of the firm. The presentation was made at the firm's recent sales convention in Waukegan. The award is made annually to the firm's outstanding district sales manager.

Shirt Sleeve Selling Stressed by Blatchford

WAUKEGAN, ILL. — The Blatchford Calf Meal Co., Waukegan, took a "shirt sleeve" approach to its annual sales convention here recently.

"Shirt Sleeve Selling" was the theme of the meeting which was under the guidance of Jack Sams, vice president and sales manager of the firm. Attending were management and district sales managers.

The two-day conference consisted of forums, round tables, talks, instruction, films and discussions, along with presentation of new advertising and sales promotion plans and materials on all Blatchford products. Discussions covered the firm's feed fortifiers, milk replacer, calf feeds and other feed lines.

Climax of the convention was the presentation of the Barwell Salesmanship Trophy, awarded annually to the firm's outstanding sales manager, to C. J. Kneale, district manager in Kansas, western Missouri, north Oklahoma and the Texas Panhandle.

The trophy was established 19 years ago in memory of John W. Barwell, founder of the Blatchford Calf Meal Co.

Ohio Marketing Conference to Stress Integration

COLUMBUS, OHIO — "Let's Discuss Vertical Integration and Contract Feeding" is the theme of the Grain, Feed & Farm Supply Marketing Conference to be held Nov. 20 at Ohio State University.

The gathering, a conference for managers and owners of elevators and related interests, will be held from 8:30 a.m. to 4:30 p.m. at the Ohio Union Building. It is sponsored by the department of agricultural economics and rural sociology at Ohio State University.

Opening the day's discussions will be Dr. Mervin G. Smith, chairman of the department of agricultural economics and rural sociology, who will answer "Vertical Integration—What Is It—Whom Does It Affect—Why Do We Have It?" He will be followed by a panel on "Effect of Contract Farming on Agricultural Business."

Panel members will be Dr. John H. Sitterly, Dr. E. F. Baumer, Dr. Paul Clayton and Dr. Richard R. Newberg, all of the Ohio staff. Dr. John W. Sharp of the Ohio staff is moderator.

The address at the noon luncheon will be given by Dr. M. E. Cravens of Ohio State University. He will discuss "What Does Vertical Integration Do to Competition for Feed Sales?" Discussing his paper will be Ralph H. Brown, vice president, Cleveland Grain Co., Indianapolis, and Dr. Ralph W. Sherman, agricultural marketing professor on the Ohio staff. G. E. O'Brien, executive secretary of the Ohio Grain & Feed Dealers Assn., will preside.

The afternoon session will include an address on "Capital and Management Needs for Integrated Agriculture" by Dr. Raymond Bailey, Ohio staff, and a discussion of the major problems of management in integrated agriculture. Also scheduled for the afternoon are a discussion "Are We Ready for Our Part?" by Kenneth E. Aschliman, manager, Archbold (Ohio) Seed & Grain Co., and a question and answer period in which questions from the floor can be directed to any member who participated in the entire day's program.

Registration for the conference is $3, which includes lunch. Reservations should be sent to John W. Sharp, Agricultural Administration, 2120 Fyffe Road, Ohio State University, Columbus.

FIRE DESTROYS WAREHOUSE

HAWKINSVILLE, GA. — One of the two warehouses of Ocmulgee Peanut & Grain Co. here was destroyed by fire recently. Cause of the $30,000 blaze was attributed to a corn shuck baler.

HIGHER QUALITY HEAT TREATED **HAMMERS**
Hammers direct from manufacturer of years' experience. Send your specifications or worn hammer. Quantity discounts on hammers and screens. Ask for prices.
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Quick Germination Test

New Vitascope Tests Grain & Seed in 5 Minutes

The Vitascope utilizes the basic proven tetrazolium method. By splitting the seeds and putting them in a vacuum under constant temperature the latent germinating power is determined in minutes.

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Burrows Equipment Co.
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Give Your Animal Feeds a SALES LIFT

Animals "go" for feeds containing ANIMAL FEED FLAVOR NO. 659 MM&R

This scientifically manufactured MM&R specialty improves the taste and aroma of your feed . . . gives it an edge over competition . . . increases your sales and profits.

Order a 5-lb. can at the bulk price of only $2.55 per lb., or write today for a free test sample (enough for 1,000 pounds of feed).

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Since 1895

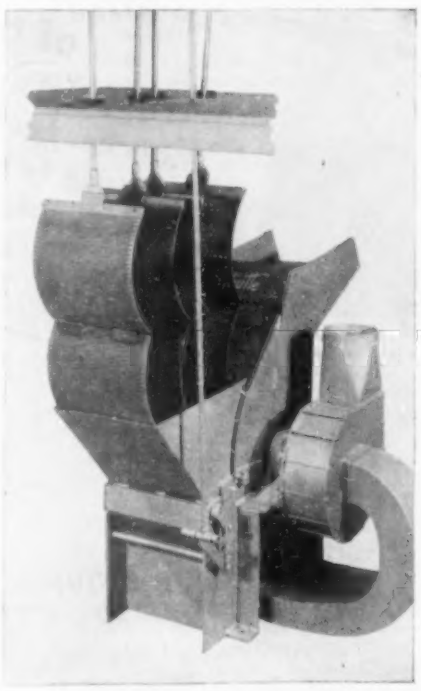
New Schutte Low-Priced Device Changes Mill Screens From Floor Above

Developed to save time and steps, a new, remarkably low priced attachment enables Schutte Hammer Mill screens to be replaced instantly from the floor above.

By means of extension handles, any one of 5 selected screens up to ¼" thick can be inserted or removed while the mill is running. With easy operation made possible by the positive action of the Schutte Patented Eccentric Lock, this new Floor-Above Screen Change feature is available for all standard Series 10 Schutte Hammer Mills. Fool-proof and trouble-free, it can be adapted to any ceiling height. Design prevents leakage around the mill.

From his upstairs station the operator simply uses the extension handles to release the screen lock, lift up the screen to be replaced, lower the new screen into position, and re-lock the entire mechanism. Milling continues uninterrupted.

Schutte manufactures a complete line of hammer mills and accessories, including replacement parts.



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For new Bulletin HW 458, and prices, write Schutte Pulverizer Co., Inc., 878 Bailey Avenue, Buffalo 6, N. Y.

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Because *ONLY* Trithiadol does *BOTH!*

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Trithiadol's superior effectiveness has been proved in commercial use (where it counts most), as well as in extensive laboratory and field tests.

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Impartial controlled testing against 4 leading coccidiostats showed that Trithiadol gave as much as $40 EXTRA PROFIT per 1000 birds. Tests were run by 21 leading feed manufacturers over a period of 15 months.

JOIN THE BIG SWING TO TRITHIADOL TO . . .

Effectively control coccidiosis in your flocks...Get top feed conversion . . . **EXTRA PROFITS.**

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NEBRASKA

(Continued from page 1)

multitude of areas, it is fundamentally putting together all facts from years of research and putting this information into the feed bag. The industry will be judged by how good a job it does in putting nutrition in the bag.

Many factors will affect the industry. Among them are industry growth, specialization, increase in farm unit size, trend toward more complete feeds and mechanized handling of those feeds.

The consumer will have to be considered even more, since he is the judge of all parts of the industry.

We will have to give far more consideration to what products we add to feed. More research is needed to make sure that new additives are adequately tested before they are put on the market.

Linear programming will also expand to provide answers to least cost formulation problems. This is a great tool, but we will still have to interpret the information the electronic brains provide.

TRANQUILIZERS IN LIVESTOCK AND POULTRY PRODUCTION—Dr. William Huber, Chas. Pfizer & Co., Terre Haute, Ind.: Certain tranquilizers have a definite beneficial effect in agriculture and veterinary medicine. However, they cannot be expected to replace sound management and good sanitary procedures.

Various compounds have produced sedation in poultry. Although some of them have been effective in reducing picking and fighting, they have the undesirable side effects of depressing feed efficiency and daily gain. Some tranquilizers have aided poultry during times of heat stress. Possibly intermediate oral administration of tranquilizers may circumvent some of the undesirable side effects.

On the basis of information that is available, use of tranquilizers for poultry and swine does not seem advisable at this time.

A true tranquilizing drug, hydroxyzine, one that produces tranquilization without producing sedation, has been found to have a very beneficial effect in cattle and sheep. In cattle there has been an increase in the average daily gain and feed efficiency of about 9%. This same beneficial effect is observed in lambs. When used as a feed additive, it does not have any deleterious effect on carcass grade or dressing percentage. It is possible that synergistic action may occur when it is used with diethylstilbestrol and Terramycin.

Drugs that produce tranquilization and sedation in animals have many uses in veterinary medicine. The exact role of tranquilizers to reduce shrinkage during shipment of cattle has not been determined. Undesirable side effects have been noted.

PHYSIOLOGICAL FACTORS IN FEED EFFICIENCY—Dr. Loyal C. Payne, animal pathology department, University of Nebraska: There is a big need for standardization in experiments to determine true feed efficiency. It is not surprising that experiments with the same additives produce such different results when there is so little standardization. A random check of swine experiments showed, for example, that average daily gains for the controls in these tests varied from 0.88 lb. to 1.57 lb.

In setting up feed efficiency tests, a standard ration should be used, the test should be run a standard number of days and the management and sanitation practices should be the same. In addition, measurement of all body functions needs to be more complete. We need to keep track of everything the animal eats and passes through, as well as environmental conditions, and then evaluate all this information. The electronic brains available today should be valuable in this evaluation.

Two keys to feed efficiency are the transfer of nutrients through the intestinal wall and metabolism in the cells. We need to know the effects of various factors on these keys.

THE EFFECTS OF MECHANICAL DRYING ON NUTRITIVE VALUE OF FEEDS—Dr. Don Clanton, animal husbandry department, and Prof. G. M. Petersen, agricultural engineering department, University of Nebraska: Generally there is little question regarding quality of feeds dried with unheated air, if the system is such that drying is completed before any significant molding or other deterioration occurs. Most of the debate occurs when drying is done with heated air. Many claims, both pro and con, are made. But there is very little research to support these claims.

Experiments conducted by the U.S. Department of Agriculture at Beltsville, Md., showed the following results: (1) Twenty-five per cent moisture corn dried with 200° F. air for four hours with an air flow rate of 80.5 cfm/bu. did not reduce the protein value of the corn; (2) 30% moisture corn dried with 240° F. air for 1½ hrs. or less with an air flow rate of 110 cfm/bu. did not damage the corn, but temperatures above this did discolor and lower nutritive value of the corn; (3) in rate feeding experiments there seemed to be a loss of protein nutritive value when 31 to 42% moisture corn was dried at temperature over 135° F. Additions of lysine and tryptophan to the ration partly corrected the loss. There was no nutritive loss in energy value of the corn dried with air temperature up to 173° F.

From this work it appears that with higher moisture content in the corn there is a lower safe level of air temperature which can be used. It was indicated in the rat feeding trials that 14.6% moisture corn could be dried at air temperatures up to 190° F. and not alter the nutritive value of the protein.

Hathaway at the Nebraska Station found that drying 27% moisture corn to 14% with air temperatures up to 180° F. did not affect the market grade of the corn, but elevating the temperature above 160° F. did reduce the nutritive value of the protein and energy as measured by rat growth.

Lamb feeding trials at the South Dakota Agricultural Experiment Station and calf feeding trials at the Illinois Station show as great and as efficient gains from high moisture corn dried artificially as from corn dried in the field.

Trials have been run at Nebraska, but results have not yet been analyzed.

LOSSES IN STORED SILAGE—Dr. Oscar E. Olson, South Dakota State College, Brookings: Experiments conducted over a period of several years have demonstrated the importance of properly excluding oxygen from stored silage if nutrients are to be preserved.

The most efficient form of storage, from the standpoint of greatest nutrient preservation, is the one that excludes the most air.

The use of preservatives with silos that do not properly exclude air has been found to be of no value. Covering with plastic has been helpful, provided the cover excludes air throughout the storage and feeding period.

The failure to properly exclude oxygen results in extensive carotene destruction, and while silage is generally considered an excellent source of this pro-vitamin A, this is not true where the more open types of storage are used.

MECHANIZATION OF FEED HANDLING FOR LIVESTOCK AND POULTRY—Art Stegner, manager, bulk storage products, Butler Manufacturing Co., Kansas City: The whole field of mechanization and modernization of feed handling equipment and housing has not kept pace with the tremendous growth experienced in breeding and animal nutrition. There is a long way to go if housing and handling equipment is to catch up and keep pace with the knowledge gained in breeding and nutrition within the past 15-year period.

Electricity is the key to the development of material handling and distribution systems to replace muscle power.

Bulk handling of feeds and mechanical distribution of feeds to livestock and poultry will be an absolute "must" in the competitive climate of the future. Helter-skelter conversion to bulk handling can cause more labor and more backaches than some of the old fashioned methods they replace. Good planning and layout of mechanical handling equipment and systems must be made before the first dollar is invested in such equipment.

Savings in labor alone can pay for equipment; time savings and elimination of backaches and sore muscles are a bonus. Augers, bucket elevators and air systems are available in a great variety of sizes.

The ultimate in mechanical handling will come when roughage, grain and supplements fed to livestock will be handled by machines from the time that the seed is first sown in the field until the time that the manure produced by those livestock is returned to the soil.

INTEGRATION PANEL—Dr. Loyd Fischer, moderator, agricultural economics department, University of Nebraska: Integration in agriculture refers to the extension of a greater or lesser degree of management control over previously independent firms. If the firms involved are engaged in successive stages in the production, processing or distribution of a product, this control is called vertical integration.

J. J. O'Connor, executive vice president, Walnut Grove Products Co., Inc., Atlantic, Iowa: Vertical integration is a real threat to the Corn Belt. American agriculture is in the midst of a scientific revolution with many adjustments taking place at all levels. Probably the most publicized is vertical integration.

Proponents — by the large feed companies and processors who want a captive market—maintain it offers the surest and fastest way to adjust to new technical advances. But does it? Will farmers reap the so-called rewards?

I think not. We have only to look at the broiler industry to see integration in action. Ninety per cent of all broilers today are produced under some form of integration. It has not been the answer. Feed manufacturers and processors have gained so much control they actually tell the producer how many birds will be raised. The result has been overproduction which in turn has brought about disastrously low prices. Integration has also reduced the once-independent producer into nothing more than a wage earner. And now there is the threat of unionization of these growers.

Do we want these conditions in the Corn Belt and our swine industry? I think not. Integration certainly will affect our economy adversely . . . through overproduction and depressed markets. This means hogs no longer will be the mortgage-lifter on the farm. We likely will see a shift in hog population from the Corn Belt. The South, which imports 40% of its pork today, could become self-sufficient by 1962 if integration continues at its present rate. The same could be true on the West Coast, which now imports 85% of its pork supply.

Farmer opinion has driven integration underground in the Corn Belt. But it doesn't have to stay there. Conditions that tempted it, if unchanged, will attract a stronger effort later. The swine producer must continue to combat integration with a more even flow of hogs to market, better housing, better management and feeding practices—more efficiency in his entire operation. And most important, he must become more aware of the demands of Mrs. American Housewife and put emphasis on production according to specification.

We in the feed industry and allied industries can help through a program of education, service and assistance. In performing these services, we will promote both progress and more efficiency which will help the livestock producer not only to resist integration but also maintain his independence and freedom of decision.

J. K. Lepley, director of sales, Foxbilt, Inc., Des Moines: We are all in integration whether we admit it or not, but I prefer to use the word programming. Integration is programming for the farmer and programming for the feed company. Some companies that say they are opposed to integration are programming in various ways—such as selling and delivering direct—to give their customers what they consider to be better service.

Integration or programming is necessary to meet the increasing needs and demands of the farmer. It is not for us to say whether the programming is right or wrong; that will be decided by the customer.

Programming in the Midwest is not comparable to the broiler integration in the South. No man without capital is independent, and that was and is the position of those growers in the South. In the Midwest, however, farmers have capital and will not lose their independence even though they enter into contract operations.

It used to be that a farmer could be a successful livestock grower if he employed good breeding, good feeding and good management. Nowadays he must also have adequate financing and good markets, two things that integration is providing.

It is up to all of us to program for the customer. If we won't program for him, some other company will.

We in the Corn Belt have no hold on any type of livestock production. We can hope to hold on to our share of the business only so long as we produce more efficiently than other sections of the country.

Everett Spangler, vice president, Federal Intermediate Credit Bank of Omaha: The food business, in which the farmer has a vital stake, is changing rapidly. The housewife is asking for, and is being given, prepackaged foods. The consuming public is more quality-conscious. The farmer must be prepared to furnish in quantity the type and quality of product the market wants at the season of the year it is needed.

An increasing number of items will be produced to specifications and probably under some form of contract agreement. The farmer may be called on to decide who will integrate whom, and some very important decisions face him in the years immediately ahead. I doubt if any producer is large enough to come through the future period of adjustment alone. I anticipate a growth in cooperatives.

We are observing various types of partnership arrangements developing among turkey producers so that the best possible uses can be made of their facilities, with production on practically a year-around basis. The farmer may find it necessary to surrender some of his independence so that he and his neighbor can supply the market on a contract that gives him a chance to earn a profit.

The farmer can no longer hope to stay in business on the basis of hard work and honesty. He must have good business management ability and the ability to produce efficiently. A farmer of this type will recognize the importance of credit and will negotiate with lenders so that he can obtain the kind of credit and the amounts he needs on terms that are favorable. Lending institutions will not find it sound to loan simply on the basis of collateral. Lenders, too, will be analyzing the farm business to determine that the investment is in balance and that the capacity to produce is sufficient to provide the family living, meet production expense, and retire capital debt. The lender is also going to be interested in the contract the farmer may negotiate with the food processor.

THE FEED MARKETS

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Demand — Supply — Trends — Prices

Quotations on feed ingredients shown in these and adjoining columns are wholesale prices, per ton, bagged, for prompt delivery, unless otherwise noted. They are the latest quotations available from Feedstuffs correspondents and are not necessarily those in effect on date of publication. The prices represent fair average trading values and do not necessarily represent extreme low or high levels at which individual sales might have occurred. A descriptive summary of supply and demand factors prevalent in the feed market appears on page 2.

A AND D FEEDING OIL

Boston: Demand slow; supply good; 400 D, 2,000 A 20¢ lb.; 300 D, 3,000 A 19½¢; 200 D, 1,500 A 16½¢; 300 D, 2,250 A 18¢; 600 D, 1,500 A 17½¢; 300 D, 750 A 14¾¢; 75 D, 750 A 14½¢.

Minneapolis: 10,000 A 35¢ lb.; 300 D, 2,250 A 21½¢ lb.; 300 D, 1,500 A 20½¢ lb.; 300 D, 75 A 18½¢ lb.

New York: Trend steady; price per lb. in 55-gal. drums (413 to 420 lb.): 300 ICU, 750 A 13½@15½¢, 1,500 A 15½@17¢, 2,250 A 17½@20¢, 3,000 A 19½@21¢; 600 ICU, 1,500 A 16@18¢, 2,250 A 18@19½¢; f.o.b. Massachusetts, New York or Pennsylvania.

Denver: Demand fair; trend steady; supply good; 2,250 A, 300 D 31¢ lb.

Chicago: Demand fair; supply adequate; straight A feeding oil, with 10,000 units vitamin A per gram 7@8¢ a million units of vitamin A, l.c.l., packed in 55 gal. drums, f.o.b. Chicago, drums included.

ALFALFA MEAL

Kansas City: Demand fair; trend steady; supply adequate; dehydrated alfalfa with 17% protein and 100,000 units vitamin A guaranteed on arrival; reground pellets $50, sacked; oiled meal $52, sacked; pellets $44@46, bulk; 18% protein, 125,000 units A meal $54, sacked; suncured alfalfa, demand slightly improved with supplies ample and prices unchanged, No. 1 fine ground $34@35, No. 1 ¼-in. $32@33, No. 2 ¼-in. $28.50@29.

Boston: Demand fair; supply adequate; dehydrated, 17% $60@62; suncured, 13% $48.

Ft. Worth: Demand fair; supply sufficient; 17% protein dehydrated $54, delivered Ft. Worth area, truck; Kansas dehydrated, 17%, 100,000 A $58, rail; suncured $39, truck.

Omaha: Demand slow; supply ample; 17% dehydrated, 100,000 A units, bulk pellets $45; sacked meal $50, Omaha basis.

Los Angeles: Demand fair; trend steady; supply adequate; dehydrated meal, 17% protein, 100,000 A $49 bulk; dehydrated pellet meal, 17% protein, 100,000 A $51, bulk; suncured crumbles, 15% protein $43@44 bulk; suncured meal, 15% protein $41@42, bulk.

Cincinnati: Demand fair; trend steady; supply adequate; 17% dehydrated, 100,000 vitamin A $59@63.

New Orleans: Demand fair; trend steady; supply adequate; $60@61; pellets $54@55.

Portland: Demand good; supply ample; trend higher; suncured $40; dehydrated $58.

Philadelphia: Demand and supply fair; trend unsettled; 17% dehydrated $60.50.

Buffalo: Demand poor; trend steady to higher; supply fair; $62, Boston.

Chicago: Demand fair; supply adequate; 17% dehydrated, with 100,000 units vitamin A guaranteed $55@55.50; 13% No. 1 fine ground $42.

Denver: Demand good; trend firm; supply ample; dehydrated $42, sacked.

Seattle: Demand fair; trend firm; supply good; 15% protein suncured $44, truck loads; 136,000 A unit dehydrated $69, truck loads.

Minneapolis: Good demand; good supply; no change in price; 17% dehydrated, 100,000 units of A, reground pellets $51, bulk; oiled, reground $2 more.

St. Louis: Demand slow; trend steady; supply ample; suncured, 13% fine $40; 17% dehydrated, 100,000 units A $55.

Memphis: Demand fair; trend higher; supply scarce; dehydrated, 17% protein, guaranteed 100,000 units vitamin A $52.

ANIMAL FATS (STABILIZED)

Louisville: Demand good; trend steady; supply ample; bleachable fancy 7⅞¢ lb.; white tallow 3⅝¢ lb.; yellow grease 6½¢ lb.

San Francisco: Demand fair; supply ample; bleachable fancy 8¾¢ lb.; yellow grease 7½¢ lb.

Ft. Worth: Demand fair; supply adequate; prime tallow, tank cars 7⅞¢ lb.; drums 9⅝¢ lb., f.o.b. north Texas packing plants with returnable drums.

Kansas City: Demand fair; trend steady; supply adequate; prime bleachable tallow 7⅝¢ lb., tank car.

New Orleans: Demand fair; trend steady; supply adequate; 7⅛@8¢ lb., tank cars.

St. Paul: Good supply; good feed demand; bleachable fancy tallow 7⅝@7¾¢ lb., f.o.b. producers' plants.

Chicago: Demand fair; supply short; bleachable fancy tallow, tank trucks or carlots 7⅞@8¢ lb.; yellow grease 7¼¢ lb.

BARLEY FEED

San Francisco: Demand fair; supply ample; rolled $60, ground $59.

Boston: Demand slow; supply adequate; $48.

New Orleans: Demand slow; supply light; trend unchanged; $60@61.

Los Angeles: Demand fair; trend firmer; supply adequate; standard rolled $3.20 cwt.; standard ground $3.20 cwt.

Portland: Demand good; trend firm; supply ample; rolled $62, ground $60.

Philadelphia: Demand slow; supply fair; pulverized $44.75.

Ogden: Supply normal; rolled $48@53; whole barley $40@45.

Seattle: Demand good; trend firm; supply fair; $52, bulk, delivered, truck lots.

Milwaukee: Demand good; supply fair; needles $1.02@1.14 cwt.; ground barley screenings $36.

Baltimore: Demand quiet; supply adequate; $44.50.

Chicago: Demand quiet; supply adequate; $34.

BENTONITE (SODIUM)

Cincinnati: Demand steady; supply adequate; f.o.b. Cincinnati, minimum 30-ton carlots: 80 granular $31.50; 200 mesh fine $31.

Denver: Demand fair; trend good; supply ample; $21.

Chicago: Demand steady; supply adequate; f.o.b. Wyoming and South Dakota shipping points; granular 30 mesh $16.50; fine granular, 80 to 100 mesh $13.75; powder, 200 mesh $13.50, f.o.b. Belle Fourche, S.D., minimum 30-ton carlots; 80 granular $13.50 net; 200 mesh fine $13.25 net.

BLOOD FLOUR

Louisville: Demand fair; trend easy; supply ample; $90@95.

BLOOD MEAL

San Francisco: Demand good; supply tight; $7 a unit of ammonia.

Portland: Demand slow; trend lower; supply ample; $110.

Los Angeles: Demand fair; trend easier; supply adequate; $7.50 a unit of ammonia.

Louisville: Demand fair; trend easy; supply ample; $95.

New Orleans: Demand fair; trend unchanged; supply light; $117@122.

Ogden: Supply normal; $107.50 in 100-lb. bags, f.o.b. Ogden.

Chicago: Demand and supply fair; $120@130, guaranteed 80% protein.

BONE MEAL (STEAMED)

Boston: Demand and supply steady; $90.

Ft. Worth: Demand fair; supply light; $85, f.o.b. Ft. Worth, local manufacture.

Los Angeles: Demand steady; trend unchanged; supply adequate; imported $73.50 in 20-ton lots.

San Francisco: Demand good; supply ample; $75.

Cincinnati: Demand good; trend easy; supply ample; $90, Cincinnati.

Louisville: Demand slow; trend steady; supply normal; $80@85 asking; can probably be had at $70@75.

New Orleans: Demand slow; trend easy; supply normal; $80@85.

Portland: Demand slow; supply ample; trend unchanged; $95.

Buffalo: Demand good; trend steady; supply ample; $90.

Denver: Demand good; trend steady to strong; supply scarce; $75, f.o.b. Bay Shore, Cal.

Seattle: Demand and trend steady; supply good; $85, ex-dock, truck lots.

Chicago: Demand and supply fair; $80@90.

BREWERS DRIED GRAINS

Boston: Demand good; supply adequate; 26% $57.75@59; 22% $57@57.50.

Ft. Worth: Demand fair; supply moderate; $54.40, November.

Los Angeles: Demand steady; trend unchanged; supply adequate; $49 bulk, $53 sacked.

Cincinnati: Demand poor; trend steady; supply adequate; $54.

Louisville: Demand fair; trend easy; supply ample; $51.

New Orleans: Demand slow; trend steady; supply ample; $52@53.50.

Philadelphia: Demand and supply fair; trend unsettled; $59.

Buffalo: Demand fair; trend steady; supply poor; $51, bulk, Boston.

St. Louis: Demand fair; trend steady; supply ample; $48.

Chicago: Demand fair; supply adequate; 26% $48@48.50.

Milwaukee: Demand good; supply fair; $48.

BREWERS DRIED YEAST

San Francisco: Demand fair; supply good; 10¢ lb.

Los Angeles: Demand and trend steady; supply limited; 10¢ lb. in 5-ton lots; 11¢ lb. in 1-ton lots; 12¢ lb. in less than 1-ton lots.

Boston: Demand and supply steady; 10¢ lb.

Omaha: 10½¢ lb.

Louisville: Demand slow; trend steady; supply ample; 10@10½¢ lb.

Portland: Demand steady; supply ample; trend unchanged; 8½¢ lb.

Buffalo: Demand good; trend steady; supply ample; $10.75 cwt.

Seattle: Demand slow; trend steady; supply ample; $12 cwt.

Denver: Demand light; trend steady; supply ample; 9¢ lb., f.o.b. Golden, Colo.

Chicago: Demand good; supply limited; 10@11½¢ lb. in carlots; 10¼@12½¢ lb., l.c.l.

St. Louis: Demand good; supply limited; 10¢ lb. in carlots; 11¢ lb. in ton lots; 12¢ lb. in less than ton lots.

Cincinnati: Carlots 10¢ lb.; 5-ton lots 11¢ lb.; ton lots 11½¢ lb.

Pittsburgh: Carlots 10¢ lb.; 5-ton lots 11¢ lb.; ton lots 11½¢ lb.

New Orleans: Carlots 10¢ lb.; 5-ton lots 11¢ lb.; ton lots 11½¢ lb.

New York: Carlots 9½¢ lb.; 10-ton lots 10¢ lb.; 5-ton lots 10¾¢ lb.; ton lots 11¢ lb., f.o.b. New Jersey.

Milwaukee: Demand good; supply limited; 10½@11½¢ lb. in carlots; 10¾@12½¢ lb., l.c.l.

BUTTERMILK-CONDENSED

New Orleans: Demand slow; trend steady; supply normal; $4.25@4.30 cwt.

Boston: Demand slow; supply light; 3½¢ lb.

San Francisco: Demand fair; supply good; $5 cwt.

Wichita: Demand good; supply insufficient; $2.85 cwt. in barrels.

Ogden: Supply average; $4.40, 100-lb. drum.

Louisville: Demand dull; trend steady; supply ample; $4.25 cwt.

Los Angeles: Demand steady; trend unchanged; supply adequate; 5½¢ lb. in 100-lb. lots; 4½¢ lb. in 500-lb. lots.

Philadelphia: Demand slow; supply light; $4.25 cwt.

Chicago: Demand light; supply adequate; $3.25 cwt. in carlots.

CALCITE CRYSTALS AND FLOUR

(All prices net, including freight and tax)

New York: Crystals $15.28, flour $10.28.
Buffalo: Crystals $16.11, flour $11.11.
Toledo: Crystals $17.96, flour $12.96.
Boston: Crystals $16.63, flour $11.63.
Limecrest, N.J.: Crystals $10.50, flour $5.50.

CALCIUM CARBONATE

Los Angeles: Demand steady; trend unchanged; supply ample; $10.25.

Cincinnati: Demand fair; trend steady; supply adequate; $8@9 cwt.

Chicago: Demand steady; supply adequate; fine grind, plain $9.54, 100-lb. bags; bulk, in hopper cars, fine grind $7.54; bulk in boxcars $3.04; granular grind $1 premium.

Seattle: Demand and trend steady; supply good; $14, ex-warehouse, truck lots.

Minneapolis: Fine grind, 50-lb. bag $12.25, 100-lb. bag $11.50; bulk, boxcar $10; bulk, hopper $9.50; coarse grind $1 premium, delivered Minneapolis.

CHARCOAL

San Francisco: Demand steady; supply ample; $141.

Boston: Demand and supply light; $100.

Los Angeles: Demand fair; trend steady; supply ample; hardwood poultry $156 in less than ton lots; $144.40 in ton lots.

Chicago: Demand quiet; supply adequate; poultry charcoal $106 ton in 50-lb. multiwalls.

COCONUT OIL MEAL

Los Angeles: Demand limited; trend very firm; supply tight; copra cake $75.50@76, bulk.

Portland: Demand good; trend firm; supply limited; $71.50.

San Francisco: Demand fair; supply ample; solvent $71; expeller $77.

Seattle: Demand fair; trend steady; supply ample; $76, ex-dock, Seattle (Philippine production).

COD LIVER OIL (FORTIFIED)

Boston: Demand fair; supply good; 600 D, 2,250 A 19¢ lb.; 300 D, 3,000 A 20½¢; 300 D, 2,250 A 18½¢; 600 D, 1,500 A 18¢; 300 D, 1,500 A 17¢.

New York: Trend steady; price per lb. in 55-gal. drums (413 to 420 lb.): 300 ICU, 750 A 14½@15½¢, 1,500 A 18½@20¢, 2,250 A 18½@21¢, 3,000 A 21½@23¢; 600 ICU, 1,500 A 17½@19½¢, 2,250 A 20@22¢, 3,000 A 22@23¢; f.o.b. Massachusetts, New York or Pennsylvania.

CONDENSED FISH SOLUBLES

Los Angeles: Demand steady; trend unchanged; supply adequate; 5¢ lb.

New Orleans: Demand light; trend steady; supply limited; 50% solid $89@92, f.o.b. Gulf.

Boston: Demand steady; supply scarce; 5¢ lb., nominal.

New York: Demand and supply fair; trend steady; 4¾@5¢ lb., f.o.b. eastern shore.

Denver: Demand fair; trend steady; supply good; dried $187.40, f.o.b. Denver.

CORN GLUTEN FEED AND MEAL

(All quotations for all cities are sacked basis, bulk basis $5 less)

Minneapolis: Feed $47.80, meal $83.80.
Atlanta: Feed $53.98, meal $89.98.
Birmingham: Feed $52.64, meal $88.64.
Boston: Feed $52.84, meal $88.84.
Chicago: Feed $41, meal $77.
Cleveland: Feed $49.14, meal $85.14.
Denver: Feed $51.51, meal $87.51.
Ft. Worth: Feed $49.96, meal $85.96.
Indianapolis: Feed $46.36, meal $82.36.
Kansas City: Feed $41, meal $77.
Louisville: Feed $48.21, meal $84.21.
New Orleans: Feed $51.20, meal $87.20.
New York: Feed $52.43, meal $88.43.
Norfolk: Feed $51.71, meal $87.71.
Philadelphia: Feed $52.02, meal $88.02.
Pittsburgh: Feed $49.96, meal $85.96.
St. Louis: Feed $41, meal $77.

CORN OIL MEAL

Cincinnati: Demand fair; trend steady; supply adequate; $49.

Louisville: Demand slow; trend steady; supply ample; $50.45.

COTTONSEED OIL MEAL

Omaha: Demand slow; supply ample; 41% solvent $60.20, bulk.

Portland: Demand good; trend higher; supply ample; $62.

New Orleans: Demand light; supply adequate; trend steady; $64.50@65.

Philadelphia: Demand and supply fair; $74.

Kansas City: Demand good in the Southwest; trend stronger; supply tight; old process meal $58@58.50, sacked, Memphis; solvent meal $57@57.50, sacked, Memphis; $64, sacked, delivered Kansas City from Texas.

San Francisco: Demand good; supply ample; expeller $60.80; solvent, 41% $62.70.

Los Angeles: Demand steady; trend firmer; smaller offerings; $51@53, bulk.

Ft. Worth: Demand fair; supply adequate; carlots, 41% old process $58; solvent $58; pellets $2 additional; cottonseed hulls $16.

Louisville: Demand fair; trend stronger; supply ample; up $1; old process $63; new process $62.

Wichita: Demand slow; supply ample; 41% old process $61.50.

Boston: Demand fair; supply ample; $72.

Cincinnati: Demand poor; trend lower; supply adequate; old process $65.

Ogden: Supply normal; 41% $63@68.

Denver: Demand and supply good; trend steady; $64.

Chicago: Demand and supply fair; hydraulic $57.50; solvent $55.50@56, basis Memphis.

St. Louis: Demand fair; trend higher; supply adequate; solvent $62.

Buffalo: Demand poor; trend steady; supply adequate; $72, Boston.

Seattle: Demand good; trend steady; supply fair; $69, delivered, truck lots, 41% expeller process.

Memphis: Demand good; trend up; supply limited; prime 41% protein, old process $58.25; new process, 41% solvent $57.25.

Atlanta: Demand good; trend strong; supply limited; 41% $64, sacked, immediate.

CURACAO PHOSPHATE

New York: Trend steady; ground Curacao phosphate in 100-lb. bags $48, f.o.b. cars or trucks, New Orleans, Jacksonville, Fla., or Philadelphia.

D ACTIVATED ANIMAL STEROL, POWDERED

Cincinnati: Demand fair; trend steady; supply ample; 1,500 ICU 11@12¢ lb.; 3,000 ICU 18¢ lb., warehouse.

New York: Trend steady; price per lb. in 50- and 100-lb. bags or 100-lb. drums: 1,500 ICU 8@12¢ bagged, 12@13¢ drums; 3,000 ICU 13@17¢ bagged, 17@18¢ drums; f.o.b. or delivered basis Pennsylvania, Delaware or New York.

D ACTIVATED PLANT STEROL, POWDERED

Chicago: Demand good; supply adequate; 4,000,000 U.S.P. units per lb., 15¢ lb. in ton lots; less than ton lots 17¢ lb.; 12,000,000 units per lb., 5 tons to a carload 28¢ lb., ton lots and less 30¢ lb.

DEFLUORINATED PHOSPHATE

Tupelo, Miss.: Minimum phosphorus 12%, minimum calcium 31%, maximum fluorine .12%, $51 net ton, f.o.b. Tupelo in 100-lb. multiwall bags, $48 in bulk.

Wales, Tenn.: Minimum phosphorus 18%, minimum calcium 33%, maximum calcium 36%, maximum fluorine .18% $69.12 net ton, f.o.b. Wales in 100-lb. multiwall bags, $3 less in bulk.

Houston: Minimum phosphorus 19%, minimum calcium 32%, maximum calcium 35%, maximum fluorine .19% $71.50, net ton, f.o.b. Houston, 100-lb. multiwall paper bags; $68.50 in bulk.

Coronet, Fla.: Minimum phosphorus 17%, minimum calcium 34%, maximum fluorine .17%, carload $60, truckload $60.75, net ton, f.o.b. Coronet in 100-lb. multiwall bags, $57 and $57.75 in bulk.

Cincinnati: 18% phosphorus $81; 13% phosphorus $64.95, sacked, f.o.b. Cincinnati.

DICALCIUM PHOSPHATE

Texas City, Texas: 18.5% minimum phosphorus, 21% minimum calcium, 24% maximum, granular $77.70 net ton, f.o.b. Texas City in 100-lb. multiwall bags; bulk, boxcars and hoppers, $3 net ton less than bagged material.

Columbia, Tenn.: Minimum phosphorus 18½%, minimum 25% calcium, maximum .01% fluorine guaranteed $83.25, f.o.b. Columbia, in 100-lb. multiwall bags; freight equalized with nearest producing point, carload basis; bulk $3 ton less.

Chicago: Stock food grade, 18.5% phosphorus, 20,000 lb. or more $83.25 net ton in 100-lb. papers, basis Chicago Heights, Ill., or Nashville, Tenn.; less than 20,000 lb. $93.25; 21% phosphorus, 20,000 lb. or more $94.50, basis Chicago Heights and Nashville; less than 20,000 lb. $104.50; bulk boxcars or hoppers $3 net ton less than bagged material.

Bonnie, Fla.: Minimum phosphorus 18½%, granular $83.25; freight equalized with closest producing point, carload basis.

Minneapolis: 18.5% phosphorus, 24% calcium granular or fine ground $94.10, delivered; $3 less in bulk.

Trenton, Mich.: Minimum phosphorus 18½%, maximum fluorine .03% guaranteed $83.25, f.o.b. Trenton in 100-lb. multiwalls; minimum phosphorus 21%, maximum fluorine .03% guaranteed $94.50, f.o.b. Trenton in 100-lb. multiwall bags.

Denver: Demand good; trend firm; supply ample; $96.

Cincinnati: 18½% phosphorus $92@93.

Portland: Demand good; supply ample; trend unchanged; $115.

DISTILLERS DRIED GRAINS

Louisville: Demand fair; trend steady; supply ample; November prices on bourbon grains: light $53, dark $55, solubles $77.

San Francisco: Demand fair; supply ample; solubles $85.

Boston: Demand good; supply improved; light $60@61; dark $62@63.

Cincinnati: Demand poor; trend lower; supply adequate; $52.

Philadelphia: Demand slow; supply light; $64 lights, $65 darks.

Seattle: Demand good; trend firm; supply ample; $87, delivered, truck lots.

Buffalo: Demand fair; trend steady to lower; supply adequate; $57, bulk, Boston.

DRIED BEET PULP

Portland: Demand good; supply ample; trend unchanged; $50.

Ft. Worth: Demand fair; supply sufficient; carlots, 50-lb. papers: November-December, plain or molasses $53.33, delivered Ft. Worth.

Boston: Demand fair; supply ample; $56.50.

Los Angeles: Demand steady; trend firmer; supply adequate; molasses $46.90@47.70, bulk.

New Orleans: Demand fair; trend steady; supply ample; $62@63.

San Francisco: Demand good; supply fair; $42.40.

Ogden: Supply average; $38@42.

Buffalo: Demand fair; trend steady; supply adequate; $56.50, Boston.

Seattle: Demand slow; trend steady; supply good; $45, delivered, carlots.

Milwaukee: Demand good; supply fair; molasses $49.50; plain $49.50.

Atlanta: Demand fair; trend steady; supply ample; $63.10, immediate.

DRIED BUTTERMILK

Louisville: Demand slow; trend steady; supply normal; 11@11½¢ lb.

New Orleans: Demand slow; supply ample; trend steady; $10.50@11 cwt.

San Francisco: Demand fair; supply ample; 11¢ lb.

Los Angeles: Demand steady; trend unchanged; supply adequate; 11½¢ lb.

Ogden: Supply normal; $7.25, 100-lb. bag.

Milwaukee: Demand and supply fair; $10 cwt.

Buffalo: Demand excellent; trend firmer; supply limited; $11.25 cwt.

Chicago: Demand and supply fair; medium acid $10@10.25 cwt.; sweet cream $10.50 cwt., in carlots.

DRIED CITRUS PULP

Los Angeles: Demand and trend steady; supply limited; orange pulp $41 bulk; lemon pulp $39 bulk.

San Francisco: Demand good; supply fair; meal $54.

Boston: Demand slow; supply light; $49.50, f.o.b. shipping point.

New Orleans: Demand fair; trend steady; supply ample; $53.50@57.50, f.o.b. Florida.

Atlanta: Demand good; trend steady; supply limited; $56.50, sacked, immediate; meal $51.50, immediate.

DRIED SKIM MILK

Philadelphia: Demand slow; supply light; $12.50 cwt.

Buffalo: Demand fair; trend steady; supply ample; spray $10.65 cwt.; roller $11.50 cwt.

Milwaukee: Demand and supply fair; $11 cwt.

Chicago: Demand good; supply light; $10.50 cwt. in carlots.

Cincinnati: Demand fair; trend steady; supply adequate; 10½@10¾¢ lb.

Los Angeles: Demand steady; trend unchanged; supply adequate; 14¢ lb. in less than ton lots; 13¾¢ lb. in ton lots.

Boston: Demand and supply fair; 12¢ lb. in ton lots.

Louisville: Demand fair; trend steady; supply ample; 11½@12¢ lb.

San Francisco: Demand and supply fair; 13½¢ lb.

New Orleans: Demand slow; supply ample; trend steady; $11.50@12 cwt.

Ogden: Supply average; $15.15, 100-lb. drum.

Portland: Demand good; supply ample; trend unchanged; 13¢ lb.

DRIED WHEY

San Francisco: Demand steady; supply good; $5.50 cwt.

Cincinnati: Demand fair; trend steady; supply adequate; $6.15 cwt.

Portland: Demand steady; supply ample; trend unchanged; $7 cwt.

Louisville: Demand slow; trend steady; supply normal; 6@6½¢ lb.

Boston: Demand steady; supply plentiful; 5½¢ lb., f.o.b. plant.

Ft. Worth: Demand fair; supply adequate; carlots, standard $6, November, delivered Ft. Worth; $6.25, November, ton lots, f.o.b. warehouse, Ft. Worth.

Los Angeles: Demand steady; trend unchanged; supply adequate; $6.16 cwt. in carloads; $6.40 cwt. in l.c.l.

New Orleans: Demand good; trend steady; supply adequate; $5.50@5.75 cwt.

Ogden: Supply normal; $6.90, 100-lb. bag.

Philadelphia: Demand slow; supply light; $6.25 cwt.

Seattle: Demand steady; trend firm; supply good; $6.40 cwt., ex-warehouse, l.c.l.

Chicago: Demand fair; supply adequate; $5.50, f.o.b. plant.

FEATHER MEAL (HYDROLYZED)

Salisbury, Md.: Good demand; steady trend; tight supply; $93 bulk, f.o.b. producers' plants.

Boston: Demand steady; supply improving; $85, f.o.b. shipping points.

Ft. Worth: Demand good; supply moderate; 85% to 87% protein $90@95, f.o.b. trucks, north Texas plants.

Los Angeles: Demand and trend steady; supply ample; $1.25 a unit of protein.

Atlanta: Demand fair; trend steady; supply ample; $93, immediate, f.o.b. Alabama and Georgia producing points.

FISH MEAL

Buffalo: Demand terrific; supply practically nil; 60% protein, menhaden $175 bulk, nominal; $180, sacked, nominal.

Denver: Demand good; trend steady; supply scarce: $2.25 a unit of protein, f.o.b. West Coast.

Seattle: Demand good; trend easy; supply limited; $2.43 a unit protein, delivered truck lots (Canadian production).

Milwaukee: Demand and supply fair; 60% $158.

Chicago: Demand good; supply very tight; eastern menhaden fish meal, 60% protein nominally $150; Gulf, nominally $150; western blended, 60% protein $2.25 a unit of protein; delivered Midwest points $170; Northwest herring-salmon blend, none available; Canadian herring 73% protein $2.25@2.30 a unit of protein, subject to production.

Los Angeles: Demand good; trend firmer; supply short; local production, 60% protein $2.25@2.30 a unit.

San Francisco: Demand fair; supply ample; $2.25 a unit of protein.

Cincinnati: Demand fair; trend steady; supply adequate; $164.

Boston: Demand active; supply very scarce; withdrawn because of scarcity.

Louisville: Demand dull; trend steady; supply tight; $165.

Ft. Worth: Demand good; supply limited; sardine $165.50, delivered Texas points from California.

New Orleans: Demand light; supply limited; trend steady; menhaden, 60% $143@145; scrap $134@135, f.o.b. Gulf.

Portland: Demand good; supply limited; trend higher; $2.25 a unit.

Ogden: Supply average; $2.20 a unit, f.o.b. Coast; 65% $151@153.

Minneapolis: Moderate demand; tight supplies; no change in price; 53 to 60% meal $165 in truck lots; 70% herring $2.30 a unit, nominal, f.o.b. West Coast.

Atlanta: Demand fair; trend strong; supply limited; 60% $168, immediate, nominal.

HAY

Boston: Demand good; supply ample; No. 2 timothy $40@42; No. 2 red clover $43@45.

Ft. Worth: Demand fair for alfalfa, practically nil for prairie and Johnson grass; supply sufficient; carlots, baled, No. 1 alfalfa $36@38, No. 2 $34@36; prairie No. 2 $26@28; No. 2 Johnson grass $24@26, delivered Texas common points.

Los Angeles: Fair interest with ample supplies; U.S. No. 1 $32@34; U.S. No. 2 leafy $29@31; U.S. No. 2 green $27@29; U.S. No. 2 $24@26.

Cincinnati: Demand poor; trend steady; supply adequate; No. 1 timothy $24; No. 1 second cutting green alfalfa $31; mixed $27; wheat or oat straw $19.

Louisville: Demand very poor; trend easy; supply good; No. 1 hay, all varieties $25, No. 2 hay, all varieties $23; straw very scarce and strong at $25; highway and construction buyers forcing up price of straw.

Portland: Demand good; trend higher; supply limited; No. 1 alfalfa $30@32.

Philadelphia: Demand slow; supply fair; $32@35.

Wichita: Demand poor; supply ample; prairie $8@10, alfalfa $10@12.

Ogden: Supply average; $1 bale; $15 ton in the field; $18 in the barn.

Denver: Demand and trend slow; supply ample; alfalfa, baled $25, first and second cutting, delivered in Denver.

Seattle: Demand fair; trend firm; supply good; alfalfa, U.S. No. 2 green $23, truck lots.

HOMINY FEED

Buffalo: Demand fair; trend steady to lower; supply good; $49 bulk, Boston.

Seattle: Demand fair; trend firmer; supply good; $53, carlots.

St. Louis: Demand fair; trend steady; supply adequate; yellow $44.

Milwaukee: Demand good; supply tight; $46.50, nominal, January only.

Chicago: Demand fair; supply adequate; $42.50.

Kansas City: Demand light; trend steady; supply tight; yellow $33.50 bulk, $3.50 more for sacks; white $1 less if available.

Boston: Demand fair; supply ample; $53.50.

Cincinnati: Demand poor; trend lower; supply adequate; $47.

Louisville: Demand fair; trend steady; supply normal; $47.

New Orleans: Demand light; supply adequate; trend steady; $47.50@49.

Memphis: Demand nil; trend steady; supply ample; white $46, yellow $46.

LINSEED OIL MEAL

Kansas City: Demand good with improvement in cattle feed business; trend stronger; supply tight as mills are not producing; solvent meal $53, bulk, Minneapolis; old process $55.50.

Boston: Demand and supply spotty; $73.50.

Ft. Worth: Demand fair; offerings light; carlots, 34% solvent: November-December $75.50@76, truck $74; pellets $2.50 premium.

Omaha: Demand fair; supply tight; 34% solvent $57.30 bulk, delivered Omaha; 32% old process $63.80, Omaha basis.

Los Angeles: Local production, 29% protein, no offerings.

San Francisco: Demand fair; supply ample; $71.

Cincinnati: Demand poor; trend steady to higher; supply adequate; new process $67.50; old process $74.

Louisville: Demand fair; trend fairly steady; supply ample; old process $76.40, steady; new process $69.90, up $1.

Denver: Demand fair; trend steady; supply good; $69.50.

Seattle: Demand fair; trend firm; supply limited; $80, carloads, 34% protein.

Milwaukee: Demand fair; supply good; old process $68.50, new process $62.50, nominal.

Chicago: Demand fair; supply adequate; solvent $56@56.50; expeller $62.50, basis Minneapolis.

New Orleans: Demand fair; trend steady; supply adequate; $68.50@69.

Portland: Demand good; supply ample; trend unchanged; $75.

Philadelphia: Demand and supply fair; 34% $73.50.

Wichita: Demand slow; supply ample; 34% $74.50.

Minneapolis: Good export and feed demand have created a tight meal supply for nearby; price up $2; solvent $53.50@54, bulk; expeller $59.

MALT SPROUTS

Milwaukee: Demand good; supply fair; odd weights $41; even weights $43.

Chicago: Demand fair; supply adequate; No. 1 $41@41.50.

Boston: Demand and supply limited; $42.50, nominal.

New Orleans: Demand fair; trend steady; supply limited; $45@46.50.

MEAT AND BONE MEAL

New Orleans: Demand fair; trend steady; supply adequate; $106@108.50.

Portland: Demand slow; trend lower; supply ample; $1.90 a unit protein.

Kansas City: Demand slow; trend weaker; supply adequate though nothing is pressing and kills remain light; 50% meat and bone scraps $90.

Boston: Demand cautious; supply ample; $1.45 a protein unit; converted 50% $85.

Buffalo: Demand fair; trend lower; supply ample; 50% meat scraps $95 bulk, $100 sacked.

Denver: Demand slow; trend slow; supply ample; 50% $82.50, f.o.b. Denver, truck lots.

Seattle: Demand fair; trend weak; supply good; $90, ex-warehouse, 50% protein.

St. Louis: Demand fair; trend lower; supply adequate; $98.

Chicago: Demand fair; supply plentiful; 50% protein $80@90.

Wichita: Demand fair; supply sufficient; 50% $107.50, f.o.b. plant; 55%, no quotations, no offerings.

San Francisco: Demand good; supply fair; $1.75 a unit of protein.

Los Angeles: Demand very slow; trend easier; supply ample; 50% protein $2 a unit.

Louisville: Demand fair; trend easy; supply ample; $90@95.

Cincinnati: Demand good; trend easy; supply ample; 50% meat and bone scraps $92, Cincinnati.

Ft. Worth: Demand fair; supply sufficient; meat and bone, 50% $89@100, f.o.b. or delivered Ft. Worth.

Omaha: $87.50.

Ogden: Supply average; $100 in 100-lb. bags.

St. Paul: Slow demand; ample supplies; weak trend brought sharp price drop; 50% meat scraps $88@92.

New York: Demand poor; trend lower; supply tight; 50% $82.50, 55% $90, bulk; 50% $85.50, 55% $93, sacked.

MILLFEED

Minneapolis: Reduced mill running time and good demand have resulted in rising prices and tight nearby supplies; forward bookings improved; bran $36.50@37.50, middlings $36.50@38; red dog $42.50@45.

Kansas City: Demand excellent with considerable quantities moving into the Southeast by truck; trend steady to strong at moment; supply tight for nearby, especially on sacked feeds; bran $34@34.75, shorts $37.50@38.25, sacked; bran $30.25@31, middlings $35@35.75, shorts $36@36.75, bulk.

Wichita: Demand active; supply adequate; basis Kansas City: bran $33.25@33.75, shorts $35.75@36.25; bran advanced 25¢ and shorts $1.75, compared with the preceding week.

Omaha: Demand good; supply tight; bran $34.50, gray shorts $39, bulk standard midds. $35; all Omaha basis.

Ft. Worth: Demand fair; supply sufficient; carlots, burlaps, prompt, bran $42.50; gray shorts $45, delivered Texas common points; 50¢ higher on bran and $2 higher on shorts compared with previous week.

Chicago: A strong market existed for millfeeds during the week ending Nov. 5 and prices rose somewhat during the period. Supplies were extremely scarce for this and next week. Quotations: bran $43@43.50, standard midds. $43@43.50, flour midds. $45@46, red dog $46.50@47.50.

St. Louis: Bran $39.50@40, shorts $43@43.50, sacked; bran $35.50@36, shorts $41.50@42, middlings $40.50@41, bulk.

Boston: Demand fair; supply light; bran $49, middlings $50.

Buffalo: Millfeed prices shot up Nov. 5

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in the wake of the elections but trade sources were uncertain whether they would hold. Demand for millfeeds was insistent to good. Mixers' inventories were light—they had overstayed the market for various reasons. Meanwhile, their business was good. Flour mill running time was a little on the light side. Bran ended up $2.50, with $2 of the rise occurring Nov. 5; middlings gained $3.50, with $2.50 of the advance taking place on the same day. Red dog was up $1. Quotations Nov. 5: bran $42.50@43.50, standard midds. $44@45.50, red dog $48.50@51. The bulk differential on both bran and middlings held steady at $5.

New York: Demand fair; trend stronger; supply good; bran $49@49.50; standard midds. $50@50.50.

Philadelphia: Demand spotty; supply fair; bran $48.50, standard midds. $50, red dog $56.50.

New Orleans: Demand fair; trend steady; supply adequate; bran $44.75@45.50, shorts $46.75@46.50.

Louisville: Demand fair; trend strong; supply good; up $1 or more on some items; bran $45.35, mixed feed $47.10, gray shorts $50.35, standard midds. $46.30.

Memphis: Demand fair; trend higher; supply scarce; wheat bran $42.50, gray shorts $46, standard midds. $45.

Seattle: Demand fair; trend steady; supply ample; $38, common transit points, carlots.

Portland: Demand good; trend higher; supply limited; $37.

Ogden: Supply normal; to Utah and Idaho: red bran and mill run $37, middlings $42; to Denver: red bran and mill run $44, middlings $49; to California: red bran and mill run $44.50, middlings $49.50, f.o.b. San Francisco and Los Angeles.

Denver: Demand good; trend firm; supply ample; shorts $39, mill run $36, bran $32, all sacked.

Los Angeles: Standard mill run $43@43.50 bulk, improved interest, firmer trend, tighter supplies; red bran $46.50@47 bulk, slow demand, firmer trend, ample supplies.

San Francisco: Demand fair; supply ample; millfeed $45.50; red bran $50.50.

MINERAL FEED

Portland: Demand good; trend higher; supply ample; $45.

Wichita: Demand good; supply sufficient; all-purpose with iodine, 50-lb. blocks $95, 100-lb. bags $90, f.o.b. plant.

San Francisco: Demand steady; supply good; all-purpose with iodine $70.

Ft. Worth: Demand fair; supply ample; all-purpose granules $89, block $94; mineral phosphorus 6% granules $105, block $110; cattle-sheep mineral 7% phosphorus granules $99, block $103; hog mineral phosphorus 3½% granules $38, phosphorus 2% $78 (all in 50-lb. paper bags).

Ogden: Supply average; $113 in 50-lb. blocks; $103, granular, 50-lb. bags.

Denver: Demand fair; trend steady; supply ample; $155.

Seattle: Demand fair; trend steady; supply good; mixer mineral $48, ex-warehouse; all-purpose mineral $85, ex-warehouse.

Sioux City: 50-lb. mineral blocks 8.2% phosphorus $92; 7.5% phenothiazine sheep mineral blocks $4 each.

MOLASSES

Ft. Worth: Demand improving; supply sufficient; blackstrap 14½¢ gal., f.o.b. Houston; delivered Ft. Worth, truck $32.50, seller's market price on date of shipment.

Boston: Demand good; supply plentiful; 17½¢ gal. in tank cars.

Cincinnati: Demand fair; trend steady; supply adequate; 13¾¢ gal., New Orleans.

Minneapolis: Weak trend; moderate demand; ample supplies; 13⅜¢ gal., New Orleans.

Louisville: Demand fair; trend easy; supply ample; 13½¢ gal., tank car lots, f.o.b. Gulf ports, off ⅛¢ gal.

Kansas City: Demand light; trend steady; supply adequate; 13¼@13½¢ gal., tank car, New Orleans.

San Francisco: Demand and supply good; $25, f.o.b. cars, Richmond, Cal.

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Los Angeles: Demand and trend steady; supply adequate; $25 bulk, f.o.b. tank cars; $25.25 bulk, f.o.b. tank trucks.

New Orleans: Demand fair; trend steady; supply ample; 15¢ gal., tank cars and trucks; 600-lb. customers' drums $9.62.

Buffalo: Demand fair; trend steady; supply good; 17⅜¢ gal., f.o.b. Albany.

Seattle: Demand fair; trend steady; supply good; $25, f.o.b. Seattle, tank car lots or truck lots.

Milwaukee: Demand and supply fair; blackstrap 14¢ gal., f.o.b. New Orleans.

St. Louis: Demand slow; trend steady; supply ample; 13¾¢ gal., New Orleans.

Denver: Demand fair; trend lower; supply good; 13½¢ gal., New Orleans.

New York: Demand and supply good; trend steady; blackstrap 17¢ gal., tank cars, tank wagons, f.o.b. New York.

Memphis: Demand better; trend steady; supply adequate; blackstrap 13⅜¢ gal., tank car, f.o.b. New Orleans, and $29.50 ton, delivered, Memphis, truck.

Atlanta: Demand fair; trend steady; supply limited; citrus $22.50, bulk, f.o.b. Florida producing points, immediate.

NIACIN

New York: Trend steady; $8 kilo, 10-kilo lots; $8.20 kilo, 5- and 2½-kilo lots; $8.30 kilo, 1-kilo lots; freight prepaid or paid to destination.

OAT PRODUCTS

Seattle: Demand fair; trend steady; supply fair; $50, bulk, delivered, truck lots.

Boston: Demand good; supply steady; white pulverized $55; reground oat feed $18@19.

Ft. Worth: Demand slow; supply sufficient; oat millfeed $43.50; reground oat millfeed 3% protein, sacked $22.

Minneapolis: Steady trend; demand slow but slightly improved; ample supplies; feeding rolled $77@78; feeding oatmeal $69; pulverized $44.50; crimped $53; reground $14.50@15.

Cincinnati: Demand poor; trend steady; supply adequate; reground oats $22; pulverized white oats $48; rolled oats $83.

Louisville: Demand fair; trend fairly steady; supply ample; reground $21.30, rolled $84.30, feeding $78.30, pulverized $49.30, crimped $65.30.

Portland: Demand slow; supply ample; trend unchanged; rolled $61; ground $58; cleaned $60.

Los Angeles: Demand fair; trend firmer; supply adequate; pulverized, local production $61.

Philadelphia: Demand slow; supply fair; pulverized white $52; Canadian oat feed $25.50; domestic $24.

Chicago: Demand fair; supply adequate; reground oat feed $13@13.50; fine ground feeding oatmeal $70@70.50; feeding rolled oats $79@80.

Memphis: Demand fair; trend steady; supply scarce; 3¼% protein, reground oat feed $19.75.

OYSTER SHELL

Seattle: Demand and trend steady; supply good; eastern $35, delivered, carlots.

Los Angeles: Demand steady; trend unchanged; supply ample; $14.80.

Boston: Demand and supply steady; in paper $25.

Cincinnati: Demand fair; trend steady; supply adequate; $23.45.

Portland: Demand good; supply ample; trend unchanged; western $34, eastern $38.50, granite grits $26, shell flour $24.

San Francisco: Demand fair; supply ample; local $15, eastern $26.

Louisville: Demand and supply good; trend steady; in 80-lb. paper $22.85, 50-lb. paper $23.10, 25-lb. paper $25.85.

New Orleans: Demand good; trend steady; supply plentiful; $17@17.50.

PEANUT OIL MEAL

Milwaukee: Demand and supply fair; 26% $42.

Atlanta: Demand fair; trend steady; supply limited; 45% $63, immediate.

PEAT MOSS

Seattle: Demand poor; trend easy; supply good; $2.70 bale, truck lots.

Chicago: Demand fair; supply short; $3.60@3.70, standard 7½ cu. ft. bale.

San Francisco: Demand fair; supply ample; $3.75 bale.

Boston: Demand and supply steady; $3.15 bale.

Philadelphia: Demand slow; supply light; $2.80 bale, f.o.b. pier.

Los Angeles: Demand fair; trend unchanged; supply ample; Canadian, 6.1 cu. ft. bales $3.85.

Portland: Demand slow; supply ample; trend unchanged; $3.25 bale.

POTASSIUM IODIDE, U.S.P.

Cincinnati: Demand good; trend steady; 90% KI in calcium stearate or carbonate mixtures, 250-lb. drums $1.35; 200 lb. in 100-lb. drums $1.35; 100-lb. drums $1.38; 25-lb. drums $1.41.

Chittenango, N.Y.: Demand good; supply adequate; 90% KI stabilized with calcium stearate, 200 lb. in 100-lb. cartons $1.35; 100-lb. cartons $1.38; freight prepaid to destination.

POULTRY BY-PRODUCTS

Ft. Worth: Demand good; supply moderate; 55% protein $100@105, f.o.b. north Texas plants.

Salisbury, Md.: Good demand; supply slightly short; $97 bulk, f.o.b. producers' plants.

Los Angeles: Demand fair; trend easier; supply ample; $1.80 a unit of protein.

Boston: Demand fair; supply improved; $97@100, f.o.b. shipping points.

Atlanta: Demand fair; trend steady; supply ample; $103, immediate, f.o.b. Alabama and Georgia producing points.

RIBOFLAVIN

Cincinnati: Trend steady; feed grade (in feed supplements) 4¢ gram in less than ton lots in 2.26 to 16 gm./lb. mixtures; 3¢ in ton lots or more, freight prepaid or paid to destination.

New York: Trend steady; feed grade (in feed supplements) 4½¢ gm. in 2.26 to 16 gm./lb. mixtures, freight prepaid or paid to destination.

RICE BY-PRODUCTS

San Francisco: Demand fair; supply ample; bran $40; polished $49.

Ft. Worth: Demand good for export, slow for domestic at present price; none offered; carlots, rice bran $37@38, nominal, f.o.b. south Texas rice mills; hulls $2, f.o.b. mills.

Los Angeles: Demand fair; trend steady; supply adequate; bran, California production, high fat content $48.

Atlanta: Demand fair; trend strong; supply limited; bran $47, sacked, nominal.

SCREENINGS

Ft. Worth: Demand almost nil; supply sufficient; ground $28, nominal.

Buffalo: Demand and supply fair; trend steady; ground $31.50, New York, lake and rail; unground, bulk $24, New York.

Chicago: Demand fair; supply adequate; ground grain screenings $30.50; Canadian, bulk $22.50.

Minneapolis: Strong undertone because of light supplies; demand weak, but expected to increase; domestic screenings higher; lights $4@12, mediums $13@22, heavies $23@34; Canadian, bulk $17; Canadian, ground $25; flaxseed screenings $38; oil type flaxseed screenings $42, basis 15%.

Cincinnati: Demand fair; trend steady; supply adequate; ground grains $34; malt house $27; Canadian $25, bulk.

SOFT PHOSPHATE WITH COLLOIDAL CLAY

Atlanta: $20.40@20.67.
Buffalo: $25.31@25.45.
Chicago: $24.77@24.90.
Cincinnati: $23.47@23.60.
Des Moines: $25.23@25.35.
Kansas City: $24.88@25.
Memphis: $22.20@22.47.
Minneapolis: $25.92@26.06.
Philadelphia: $24.32@24.95.
St. Louis: $24.14@24.27.

SORGHUMS

Ft. Worth: Demand fair; offerings light as crop going into government loan; carlots, bulk, No. 2 yellow milo $2.18@2.21, delivered Texas common points.

Los Angeles: Demand and trend steady; supply ample; milo $2.32½ cwt., bulk.

SOYBEAN OIL MEAL

Denver: Demand fair; trend steady; supply good; $67, sacked, Denver.

Seattle: Demand steady; trend firmer; supply ample; $78, carlots.

St. Louis: Demand fair; trend higher; supply short; 44% solvent $60.50.

Minneapolis: Strong demand increased price $2 during the week; ample supplies; 44% $43, bulk, Decatur for Minneapolis shipment; 50% $66, bulk, delivered Minneapolis.

Milwaukee: Demand good; supply fair; $47.50, bulk, Decatur.

Chicago: The market for soybean oil meal was active during the week ending Nov. 5 and prices rose during the period. Supplies were somewhat scarce for nearby needs. Quotations: 44% protein soybean oil meal, bulk, unrestricted, basis Decatur $51.50; eastern restricted $50; 50% bulk, unrestricted, basis Decatur $57; eastern restricted $55.50@56.

Louisville: Demand fair; trend strong; supply ample; $61.20, up $2.50.

Cincinnati: Demand poor; trend higher; supply adequate; $49, bulk, Decatur.

New Orleans: Demand fair; trend steady; supply normal; $66@67.

Ft. Worth: Demand good in nearby positions; supply sufficient; carlots, 44%: $70 November, $70.50 December, $71.50 January-March coupled; 50% protein: $76 first half November, $77 last half November and December; $79 January-March coupled, $80 January-June; truck meal 44% $63, scattered November-December.

Kansas City: Demand slow; trend stronger; supply adequate; meal for Kansas City and western shipment $46.50, bulk, Decatur; unrestricted $49.50@50.

Boston: Demand cautious; supply plentiful; 44% $47.50; 50% $54, both bulk, f.o.b. Decatur.

Omaha: Demand fair; supply ample; 44% $53.90, bulk.

Los Angeles: Demand steady; trend firmer; supply ample; $74.50@75, bulk.

San Francisco: Demand fair; supply ample; $77.50.

Portland: Demand improved; trend unchanged; supply ample; November $41; December-March $43.

Philadelphia: Demand and supply fair; 44% $46.50, bulk, Decatur.

Wichita: Demand good; supply tight; 44% $62, 50% $70, f.o.b. Wichita.

Ogden: Supply normal; $81@86.

Atlanta: Demand good; trend strong; supply ample; 44% $65.50, immediate.

Memphis: Demand good; trend steady; supply limited; prime 44% solvent $60.50.

TANKAGE

Cincinnati: Demand good; trend easy; supply fair; 60% digester $102, Cincinnati.

Louisville: Demand fair; trend easy; supply normal; 60% $95@100.

New Orleans: Demand fair; trend steady, supply ample; $119.50@120.

Wichita: Demand fair; supply sufficient; 60% $110, f.o.b. plant.

St. Paul: Slow demand; ample supplies; price down $5 or more; 60% digester $91@93.

Kansas City: Demand slow; trend weaker; supply generally adequate although there are some instances of tightness; 60% digester $95.

Ft. Worth: Demand slow; supply light; 60% digester $92@93, f.o.b. Ft. Worth.

Chicago: Demand and supply fair; 60% protein $85@95.

St. Louis: Demand good; trend lower; supply adequate; $101.

Omaha: $90.

VEGETABLE AND ANIMAL FAT (HYDROLYZED)

Ft. Worth: Demand good; supply limited; 7⅝¢ lb., f.o.b. north Texas area.

VITAMIN E FEED SUPPLEMENT

Rochester, N.Y.: Demand and supply good; trend steady; 100-lb. drums $1.50 lb., 25-lb. drums $1.55 lb., f.o.b. manufacturing plants, freight allowed and goods insured to destination.

New York: Demand and supply good; trend steady; 100-lb. drums $1.50 lb., 25-lb. drums $1.55 lb., f.o.b. manufacturing plants, freight allowed and goods insured to destination.

Cincinnati: Demand good; trend steady; any quantity in 100-lb. drums $1.50; in 25-lb. drums $1.55; freight allowed to destination.

WHEAT GERM MEAL

New Orleans: Demand and supply fair; trend steady; $108@110.

Buffalo: Demand and supply fair; trend lower; commercial grade $76, f.o.b. Buffalo.

Chicago: Moderate demand; good supply; steady trend; $90.

RENDERERS

(Continued from page 4)

other elements found, and their proportions, are governed by their price. For instance, the value of fat in a feed is affected by the fluctuation of corn and soybeans.

Showing slides, Dr. Combs demonstrated the advancing efficiency of feeds for poultry over a period of years. Producers now expect to have 3-lb. broilers in eight weeks with a 2.2 conversion ratio. Sometime in the future there is a chance that 3-lb. birds can be produced with a feed conversion approaching the 1:1 ratio, and the feeding period will be reduced to six weeks, Dr. Combs believes. The fat content of such a ration approaches 30%.

Protein in a diet is made more effective, he said, if methionine and lysine are added to high-fat rations.

Evaluation of Protein

The use and evaluation of protein in animal nutrition was discussed by Charles A. Denton, animal husbandry research division, Agricultural Research Service, Beltsville, Md. He said that many methods have been proposed for assaying the biological worth of a protein, and that generally all of these methods attempt to align proteins in a relative order of nutritive value.

"Since most biological procedures are rather time consuming, it has been the goal of the nutritionist to find a quick chemical method that will give some indication of protein value. One such method that has appeared to be reasonably successful is based on the hypothesis that the amino acid lysine is nutritionally available only when its terminal NH_2 group is free," the speaker said. "The 'available' lysine can be measured colormetrically as the dinitrofluorobenzine derivative, since this compound reacts with the free NH_2 group to give a color. In the case of some protein concentrates, a very good correlation has been established between the results of this test and chick growth."

He went on to say that in order to use proteins most efficiently, the amino acid pattern and the quantities of amino acid available to the animal should be known. "To estimate the amino acid content by present methods, the protein must be subjected to either acid or enzymatic hydrolysis and then the individual amino acids determined by chemical, microbiological or chromatographic procedures," Mr. Denton explained.

"The values in the literature show that varying results are obtained with the commonly used protein sources, using the different procedures for the analysis. Even if precise values could be obtained by any of these methods, one would indeed be an optimist to assume that the values would accurately reflect the biological response.

"If one realizes the limitations of the amino acid values, they are of help in predicting the biological value of protein, but it is indeed very frustrating to find several different values for the amino acid content of a protein concentrate, and to have to make a choice as to which one to use.

"Considerable error may enter into the formulation of a diet when the amino acid values assigned to the dietary constituents are based on selected literature values rather than on the analysis of the materials actually used."

He mentioned that it is well known that the biological value of the major concentrates used in poultry diets—soybean oil meal, cotton seed meal, meat meal and fish meal—is affected by processing methods. "It appears, in general, that the loss in quality of the oil seed meals is correlated with the availability of lysine," he said.

"Earlier, the nutritionist divided proteins into two classes, those of good quality and those of poorer

IMPROVEMENT IN CAR SHORTAGE INDICATED

WICHITA — Following complaints of a shortage of boxcars for the heavy grain movement in Kansas, Sen. Andrew F. Schoeppel (R., Kansas) called on the Association of American Railroads in Washington recently. In a telegram received by Sen. Schoeppel Oct. 30, the railroads indicated a rapid improvement in the situation and the prospect of an early end of the shortage. A survey made by the railroads, at the request of Sen. Schoeppel, reveals the roads serving Kansas during the eight-week period ending Oct. 18 loaded 37.8% more carloads of grain than during the same period last year. This compared with an 18% increase nationally. There will be continuing improvement, as the soybean and rice harvests are drawing to a close, permitting the release of more boxcars into this area.

quality, the former being of animal and the latter of vegetable origin. It has since become evident that the superiority of animal protein does not necessarily reflect its better amino acid composition and that the beneficial effect was partly due to accompanying vitamins and unidentified factors. The distinction between these two classes of protein is not always justified."

Looking Ahead

A look at prospective developments in animal nutrition in the next 25 years was provided by Dr. George M. Briggs, National Institutes of Health, Bethesda, Md. He first outlined several factors which will make it possible to meet a much larger population's demand for meat, milk and eggs in 1983. These include: (1) Increased efficiency in feed utilization—at least a 30% improvement is possible in all classes of livestock. (2) Increased production efficiency through advances in genetics, animal health and management. (3) New sources of feedstuffs and nutrients. (4) Higher yields of crops per acre. (5) More and better trained personnel.

In basic nutrition research in the next 25 years, said Dr. Briggs, perhaps the most fertile field will be continued study of factors necessary for maximum growth, production and efficiency. More research will be done on nutritional interrelationships. Basic studies on relationship of nutrition to disease, to genetics, to endocrinology will yield new benefits. Basic advances in biochemistry and physiology will result in new concepts of growth and in new chemical substances of benefit. New discoveries will be made on factors affecting digestion—use of enzymes is a start in this direction.

Dr. Briggs said one of the areas of greatest expansion in applied research will be in growth promotants. Other areas will be the search for new sources of nutrients, more research on feeding methods, studies on environment and its relation to nutrition and animal production.

The field of animal nutrition is still very young; much remains to be learned, said Dr. Briggs.

Commenting on the role of the renderer, he said that through association efforts, it can be expected that better standards will be developed for the industry's products, which will continue to be valuable ingredients. Continued research will be needed. Dr. Briggs also suggested continuing research on new or better uses for renderers' products. And, he said, the renderer might seek other sources of animal by-products which may have value in feeding. Perhaps, he added, the renderer should consider making feeds from such things as garbage, vegetable wastes, leaf matter and similar materials.

One of the speakers on the final day of the convention was John W. McCutcheon, John W. McCutcheon, Inc., New York. He noted that soap now commands less than one third of the market for tallow. Each year there is a reduction in the amount of inedible tallow and grease going into the detergent field. Mr. McCutcheon said it appears that the downtrend in use of tallow in detergent materials might be reversed by development of a few new processes. Greater emphasis is needed on the engineering of new processes, he said.

R. F. Brown, organic chemical sales manager for Emery Industries, Inc., Cincinnati, talked about the development of chemicals from tallow, citing the products made from oxidation of unsaturated acid as particularly promising. He said that the many millions of dollars being spent on research in this field should open up even more new horizons for chemical products from tallows.

Roger E. Morse, James F. Morse & Co., Boston, traced the growth and accomplishments of the association from its beginning in the early 1930's. He said that perhaps the most important lesson to be learned from the past is that all industry must face changing conditions, and that research and appropriate promotion are the best tools presently available to make the most of these ever changing conditions.

Contest Winner Announced

A vacation trip to Cuba for two, including $500 cash for expenses, was awarded to the winner of the 25th birthday contest sponsored by the NRA. The award was made at the 25th annual banquet Nov. 4.

Contestants were to state, in 25 words or less, their answers to the question: "In its first 25 years, I feel the most important contribution of the National Renderers Assn. to the rendering industry and agriculture has been . . . "

The winning entry completed the question as follows: " . . . the 'everybody benefits' development of fat-enriched feeds. Feed manufacturers, agriculture and consumers gain from these better feeds for better foods, broadening markets for renderers."

The contest was judged by Reuben H. Donnelley Corp., Chicago, and the presentation was made at the banquet by J. K. Healy, Kavanaugh Products Corp., Baltimore, Md. The winner was Henry S. French, Feedstuffs, Chicago.

SURVEY

(Continued from page 1)

bushels would meet the expected usage.

If estimates of the committee are realized, the 1958-59 period will be the third year of expansion in the current cycle. It will provide consumers with one of the largest total supplies of meat, milk, eggs and other livestock products ever experienced.

BIG INCREASE IN HOGS: The 1958 fall pig crop is estimated to be 42 million head, 15% more than the pig crop of the preceding fall. It is estimated that 60,129,000 pigs will be produced in the spring of 1959, which is approximately 14% more than the 52,745,000 produced in the spring of 1958.

It is expected that the average slaughter weight of all hogs marketed in the 1958-59 feeding year will be 232 lb., 1 lb. less than 1957-58.

The trend toward earlier farrowings is expected to continue. This will result in a larger percentage of the spring pig crop being fed out of the previous year's feed supply.

BROILERS, LAYERS, TURKEYS TO INCREASE: There will be a 3% increase in numbers of layers during the 1958-59 feed year. Broiler production will show a marked increase of 10%, and turkey production will increase 5% over last year.

The average number of layers for the period Oct. 1, 1958-Sept. 30, 1959, will be approximately 309 million.

A 6% decrease is expected in numbers of chickens raised for a total of 410 million.

Commercial broiler production in 1959 is expected to reach 1,815 million, an increase of approximately 10%.

It is anticipated that 83 million turkeys will be raised in 1959, which represents a 5% increase over 1958. The shift to heavier weights will continue, resulting in 13,300,000 being marketed as light, and 69,700,000 as heavy turkeys. Breeding turkeys will be increased by 13% over 1958 for a total of 3,900,000.

FEWER COWS — SAME TOTAL MILK: The number of cows to be milked in 1959 is expected to be 19,400,000, a decrease of approximately 2% compared with 1958. The number of heifers to be raised for replacement is estimated to decline about 1% from 1958.

Total estimated milk production of 126.5 billion pounds is about the same as 1958, and is the result of a 2% decline in cow numbers, coupled with a 2% increase in yield per cow. The rise in yield will be due in large part to heavier grain feeding.

Roughage is plentiful in most sections, although the quality is spotty compared to last year. Concentrates are in abundant supply and are available at more favorable price ratios. It is estimated that the feeding rate will be 2,100 lb. per cow, an increase of 3% over 1958.

BEEF HERDS ARE BEING EXPANDED: It is expected that the number of beef cattle on Jan. 1, 1959, will be 62,150,000, 3% more than Jan. 1, 1958. Substantially more calves will be withheld from slaughter. Some will go into breeding herds, and some will go into feed lots.

MORE SHEEP: The total number of sheep and lambs is expected to increase about 4% during the feed year ending Sept. 30, 1959. Increased forage production in both the range and farm flock areas should favor retention of increased numbers of ewe lambs for replacements. A slight increase over last year is expected in the number of lambs to be fattened.

HORSES CONTINUE DECLINE: The number of horses and mules is expected to decline 4% in 1958-59 as compared to the previous year. This is a smaller decrease than in former years, and may indicate an approaching end to the reduction in the number of this class of livestock.

OTHER ANIMALS: This report includes an estimate of feed use by miscellaneous livestock and poultry in cities and towns, and unreported animals on farms. This grouping includes fur-bearing animals, goats, rabbits, dogs, cats, etc. The feed use by these animals is estimated to be a little more than 4 million tons.

FEED SUPPLIES PLENTIFUL: Feed supplies for the current year are plentiful. Supplies of both grains and high-protein feeds are more than adequate to take care of any reasonable increase in feeding operations during 1958-59.

Record crops of corn, sorghum grain, barley, soybeans and an above-average oat crop, all of excellent quality, assure bountiful feed supplies for the current year. Total supplies of 186 million tons of grains, oilseed meals and all other concentrates are available for feed in 1958-59, as compared to 127 million tons actually fed last year. Exports and imports, industrial and other non-feed uses, and reasonable end-of-year stocks were allowed for in calculating these supplies available for feed.

Total supplies of the five major oilseed meals available for feed in 1958-59 are estimated at 12.8 million tons, compared with 10.7 million tons fed last year. This is an increase of 20%, much of it accounted for by the very large soybean crop. The oil-meal equivalent of all high-protein by-products for feed amounted to 14,392,000 tons in 1957-58, up 4% from the year before. The supply available for 1958-59 is calculated to be 16,590,000 tons, an increase of 15% over 1957-58.

SUPPLIES

(Continued from page 1)

Heavier feed consumption is in prospect for 1958-59, and exports of feed grains are expected to continue high, but even allowing for heavier utilization, the total carryover of feed grains into 1959-60 is expected to increase to around 75 million tons, 16 million more than the carryover into 1958-59.

Protein Feeds

The total supply of protein feeds, meanwhile, has increased steadily for several years, reaching an estimated 13.9 million tons (soybean meal equivalent) in 1957-58. A record soybean crop available for crushing in 1958-59 and a modest increase in the cotton crop will contribute to greater supplies of oilseed meal in 1958-59.

Supplies of oilseed cake and meal for 1958-59 are expected to total around 12 million tons. Production is expected to exceed the 10.8 million tons produced in 1957-58 with gains made in every major oilseed meal except copra.

Reporting on the individual feed grains and protein feeds, the USDA said the U.S. corn supply is now estimated at 5,154 million bushels, 330 million more than last year and over a billion bushels more than the average. The grain sorghum supply for 1958-59 is estimated at 916 million bushels.

By-Product Feeds

Supplies of soybean meal for 1958-59 are expected to total over 8.8 million tons, around 6% more than last year. The quantity available for feeding in 1958-59 would be up by more than 400,000 tons from the 7,970,000 tons fed in 1957-58.

The supply of cottonseed meal is expected to be around 150,000 tons over the 2,168,000 tons in 1957-58.

Tankage and meat meal production should also increase as livestock and poultry slaughter rises, probably around 5 or 6% over the 1957-58 level.

Supplies of gluten feed and brewers' and distillers' dried grains available probably will continue at the 1957-58 rate of 1.5 million tons. Supplies of wheat millfeeds and alfalfa are also expected to remain near the 1957-58 level. Fats and oils feeding in 1958-59 is expected to about equal the high level fed during the past year. Molasses supplies will also equal about the same amount as that available for livestock feeding during 1957-58.

PURINA

(Continued from page 1)

announced at Macon, Ga., that its cottonseed crushing mill at Macon will be closed at the end of the current season due to a continuing decline in the cotton crop in the South. The company's mill at Jackson, Miss., will be closed at the same time, according to Walter Lingle, Jr., Buckeye executive, Cincinnati.

"It has become obvious that we cannot now or in the future purchase sufficient supplies of cottonseed in the Macon and Jackson areas to allow the mills to operate efficiently," Mr. Lingle stated.

He was quoted in Cincinnati as saying that the Buckeye company entered the soybean crushing business primarily to supply Procter & Gamble with soybean oil. Recently, however, he said, the increasing importance of soybean oil meal for animal feed has made it desirable for soybean crushers to enter the feed business.

Mr. Lingle said that since Procter & Gamble is not in the feed business, it became sound business policy for the firm to buy soybean oil on the open market and dispose of a portion of its plants.

Buckeye will continue to operate some other oilseed processing facilities.

Chicks Placed in Principal Broiler Areas

(000's omitted)

Week ending	Maine	Conn.	Penn.	Ind.	Ill.	Mo.	Del.	Md.
August 30	1,071	623	940	886	187	643	1,759	1,798
September 6	1,022	600	938	870	226	628	1,483	1,930
September 13	1,070	536	758	864	142	583	1,566	1,763
September 20	870	513	692	752	180	552	1,371	1,714
September 27	1,009	551	680	682	152	495	1,450	1,789
October 4	1,103	433	767	760	202	567	1,601	1,674
October 11	1,087	489	584	727	159	570	1,576	1,690
October 18	1,082	378	633	713	119	495	1,445	1,643
October 25	1,056	419	589	646	96	557	1,686	1,566
November 1	1,033	416	768	707	127	535	1,813	1,570

Week ending	Va.	W. Va.	N.C.	S.C.	Ga.	Fla.	Ala.	Miss.
August 30	1,163	639	2,395	361	5,093	171	2,417	1,649
September 6	1,188	537	2,337	309	4,879	202	2,366	1,658
September 13	1,138	589	2,341	321	4,648	215	2,391	1,553
September 20	1,015	497	2,329	292	4,573	151	2,293	1,600
September 27	1,059	423	2,245	332	4,602	178	2,239	1,649
October 4	956	563	2,351	313	4,927	144	2,382	1,723
October 11	1,039	478	2,398	344	4,942	151	2,526	1,639
October 18	932	446	2,352	362	5,002	182	2,355	1,637
October 25	834	485	2,229	315	5,034	180	2,285	1,613
November 1	894	571	2,307	297	5,121	213	2,496	1,668

Week ending	Ark.	La.	Texas	Wash.	Oregon	Calif.	Total 22 areas 1958	1957
August 30	2,587	373	1,869	344	125	824	27,917	25,490
September 6	2,381	395	1,898	359	168	878	27,252	25,228
September 13	2,283	400	1,740	342	176	914	26,335	25,028
September 20	2,165	355	1,618	249	193	821	24,803	24,298
September 27	2,242	309	1,469	287	175	829	24,846	24,134
October 4	2,405	371	2,023	247	123	871	26,506	24,675
October 11	2,416	404	2,165	272	149	770	26,574	24,237
October 18	2,374	423	2,126	219	141	761	25,820	23,930
October 25	2,475	411	1,963	281	118	773	25,611	23,413
November 1	2,465	357	2,143	298	140	792	26,731	23,058

PELLETS

(Continued from page 7)

trols, gauges, valves, piping, drives, etc.

Basically, said Sprout-Waldron engineers, both systems work the same way: "Good hard pellets are brought to the cascade spout by the feeding device and then cascade in front of the spray manifolds. From these manifolds they receive the proper percentage of fat before they slide into the retention drum. The drum turns slowly as the pellets cool. At the discharge end of the drum, the pellets pass through a scalping screen where any agglomerates are separated before the pellets are discharged. When percentages of more than 5% of fat are added, the pellets drop into follow-up bins to allow longer penetration time."

Controls in the OS system work this way: Pellets are brought in through a scale meter which automatically sends out an air signal proportionate to the weight of the pellets at any given time. This signal controls the variable speed primary drive which powers the secondary drive connected to the pump. The pump then operates at a speed necessary to proportion the fat into the pellet stream at the desired percentage. Changes in pellet volume within the capacity range of the system are handled automatically. Changes in percentage are made with a push-button control.

In the OB system, pellets drop into a volumetric feeder with a variable speed drive. The evenly fed pellets drop into the cascade spout and receive the pre-set percentage of fat. The pump has a constant speed drive. However, the fat percentage is regulated by a Varitrol fat regulator, with the operator simply turning a dial. Some of the features of the system, according to Sprout-Waldron, are: Wide capacity range; percentage of fat automatically regulated; fat meter totalizing so that inventory can be taken regularly; complete and accurate fat coverage assured with cascading pellets; low capacity system easily expanded; fat addition range from 1 to 10%; wider selection of fat mixtures permitted by adding fat to finished pellets; harder pellets produced by adding fat to finished pellets; minimum of fines by use of retention drum, with its flights and baffles revolving at low speed.

To Handle Publicity

Fred Lang, vice president, Nemarow Advertising Agency, Vineland, N.J., has been retained to handle press room activities and public relations at the National Turkey Federation Convention and Turkey Industry Exposition in Des Moines, Iowa, Jan. 6-8, 1959.

Sound Business Basis Stressed for Poultry Industry in Missisippi

BILOXI, MISS.—Methods for keeping Mississippi's rapidly growing $75 million poultry industry on a sound business basis were exchanged at the annual convention of the Mississippi Poultry Improvement Assn. held here recently.

Poultry leaders from several states explained details of more efficient production, improved business analysis and better merchandising. The discussions covered all segments of the industry represented by the association.

Fred Gaddis, Forest, Miss., moderating a panel discussion, said that extensive contract operations found in much of the state's broiler industry can help to control seasonal overproduction. He said the contract should offer the family feeding the chickens an incentive for better than average management. He added that there is room particularly for efficient independent owners of hatching egg supply flocks.

Continued efforts toward greater efficiency and a better product for the consumer through improved poultry breeding were discussed by another panel headed by James E. Hill, head of the poultry department at Mississippi State University.

D. F. King, head of the poultry husbandry department at Alabama Polytechnic Institute, reviewed research behind the Alabama Experiment Station suggestion of starting chicks for commercial laying with much less than the normal hours of light and then gradually increasing it.

C. G. Bowes, merchandising consultant, Park Ridge, Ill., said that chicken is not just a weekend purchase. "Because it can be cut and prepared more ways than other meats, chicken is more profitable than most retailers realize," he said.

Total registration for the three-day meeting was 508. C. T. Ramzy, Carthage, was elected president.

Alfalfa Processors Assn. President Resigns

TOLEDO, OHIO—At a meeting of the board of directors of the Alfalfa Processors Assn. Oct. 16, Rolland Turnow resigned as president of the organization.

Marvin Rohloff, vice president, assumed the duties of the president until the January meeting, when new officers will be elected.

Lester Lusher, program chairman, is planning a fall meeting in November, the actual date of which will be announced as soon as details have been completed.

F. C. Bisson

F. C. Bisson Retires From Chicago Board

CHICAGO — F. C. Bisson, veteran of nearly a half century of close association with the grain business, retired Oct. 31 as director of marketing research and information for the Chicago Board of Trade.

He was first exposed to the grain business in 1912 when he entered the employ of the Minnesota State Grain Inspection & Weighing Departments as a grain weigher and sampler. Following seven years in that connection, he resigned to become affiliated with the Daily Market Record, pioneer grain trade publication in Minneapolis. He covered the grain, flour, feed and hay markets at the Minneapolis Grain Exchange and eventually edited the publication and served as advertising manager.

Mr. Bisson resigned there in late 1926 and moved to Chicago to open a market news service on grain, hay, feed and seeds for the Bureau of Agricultural Economics of the U.S. Department of Agriculture. He inaugurated and maintained radio programs on the grain market on five Chicago radio stations and the National Broadcasting Co. He had a daily broadcast on station WLS for more than 27 years. He also was a licensed federal appeal inspector on soybeans.

In 1941, he resigned from the USDA to accept a position as director of public relations and education for the Chicago Board of Trade, which he held until 1948 when he became director of marketing research and information, a post he held until his retirement.

Mr. Bisson expects to continue in market news reporting as a private enterprise.

Plans Set for Annual Bourbon Beef Show

LOUISVILLE — An estimated 800 head of cattle from eight states will be shown in the annual Bourbon Beef Show to be held Nov. 12-14 at the Bourbon Stock Yards here. Cash prizes totaling $18,000 will be awarded.

Single Angus, Hereford and Shorthorn steers will be judged the first day. Groups of three and carloads of 15 will be shown the second, and cattle will be sold at auction on the last day.

The show is promoted by the distilling industry in the interest of distillers dried grains as a feed ingredient and by the Bourbon Stock Yards.

FEED STORE BURNS

OKLAHOMA CITY, OKLA.—A fire destroyed Wolf's Feed Store, Stroud, Okla., and contents worth approximately $15,000 recently, according to Milton Wolf, proprietor. Cause of the blaze, which burned several businesses, presumably was defective wiring.

See Increase in Farm Efficiency And Integration

AMES, IOWA—An increase in vertical integration and sharp increases in size and capital requirements of farms are foreseen by two economists from the U.S. Department of Agriculture.

The two economists are G. T. Barton, Agricultural Research Service, and Rex F. Daly, Agricultural Marketing Service. They were authors of a paper presented at a recent week-long conference here on "Problems and Policies of American Agriculture." The conference was held at the Iowa State College Center for Agricultural Adjustment.

1975 Demands

The economists estimated 1975 demands for farm products on the basis of population of about 233 million persons. They predicted an increase in livestock production of about 45% to meet 1975 needs.

The 1975 production needs will be met "without any great difficulty," said Mr. Barton and Mr. Daly. They pointed out that this production would require no increase in acreage, would be done with one third fewer man-hours and with two million fewer farm workers than were employed in 1956-57. There will, they indicated, be a large increase in what they called "non-farm inputs," including such things as fertilizers, feeds and mechanization.

Fewer Farms

The economists speculated on some of the changes ahead for commercial farming. They said that the 3.1 million commercial farms of 1954 may shrink to about 2 million by 1975. In terms of size of farms, they look for a 50% increase in average commercial farm acreage. In terms of output and capital requirements of the commercial farm, they estimated that both in 1975 would be double the 1956-57 figures.

Growth in capital requirements and in the "non-farm inputs," they said, will make financing a major consideration. They declared their opinion is that financial needs, plus growing complexity of economic and technical phases of farming, will foster an increase in vertical integration.

J. Chrisman Named To Advisory Committee

KANSAS CITY—Joseph Chrisman, executive vice president of the American Dehydrators Assn., Kansas City, has been named by Ezra Taft Benson, secretary of agriculture, to serve a two-year term on the feed and forage research and marketing committee of the U.S. Department of Agriculture.

Advisory committees function in several areas. Their general functions are the following:

Acquaint themselves with the problems of producers, processors, distributors and consumers and present them for committee consideration.

Review the current research and marketing service programs of the USDA and recommend adjustments, including terminations, in order that available funds will be used on problems of greatest importance.

Recommend new work or the expansion of current work and indicate the relative priority of such recommendations when the current program is insufficient to develop solutions for important problems.

Develop a better understanding of the nature and value of the agricultural research program, explain it to interested persons, groups and organizations and encourage wider and more rapid application of research findings.

MARKETS

(Continued from page 2)

to available reports. Dairy feeds in particular are on the increase due to the establishment of the milk base.

Dry lot cattle feeders continue a heavy feeding program and considerable interest is shown in feed in pelleted form, which is increasing yearly. Poultry feeds are off from recent high tonnage figures, but volume and running time are still reported to be good.

Citrus pulp production is getting under way in the Florida producing area in a very limited way, and at the present time it is generally expected that only nominal tonnage will be available before the first half of December. Supplies are scarce and the market remains firm.

Most purchasing agents for feed manufacturers report relatively low inventories on most ingredients.

Central States

The formula feed business picked up again during the week ending Nov. 5 and a general upturn was noted for the first of November. It was thought that November might be another very good month as October proved to be a record month and November was starting out very well. Prices appeared to be stabilizing on most feed ingredients and it was thought this was a primary reason for a better week of sales.

The best movers continued to be hog feeds and poultry feeds, while turkey feeds were still very good. Cattle feeds appeared to be picking up somewhat during the period.

Mills mostly reported a day-to-day basis. However, a few report one to two days' order backlogs. Mills are operating on a five-day week basis for the most part.

Ohio Valley

Business was reported somewhat spotty this week in the Ohio Valley, but still holding up remarkably well in view of cleaning up of harvesting activities and the plentiful supplies of most farm crops. While buying continues mostly on a hand-to-mouth basis, and probably will continue so until decidedly colder weather sets in, manufacturers point out that the turnover is well ahead of the volume recorded a year earlier, and has every indication of increasing during the weeks ahead.

Helpful in this respect are the increased deliveries of farm animals to area stockyards and the steady and profitable prices at which these animals are being sold, indicating that in the now booming economy, larger tonnages of meats are in strong demand. With this incentive to farmers to increase their restocking activities, the future feed business prospects appear brighter than in some months.

The same situation is holding true with respect to consumer demands for eggs and poultry, both of which advanced slightly in price this week in area wholesale markets, with receipts being readily absorbed.

While most valley plants were able to keep production in line with two-shift operations this week, several plants said some weekend activities were necessary to insure prompt deliveries.

South Central

Formula feed sales were generally described as good this week. Most manufacturers reported their sales are in a steadily rising trend, gaining just a little each week. October delivery figures have been completed and nearly all show a good gain over September and an excellent improvement over October a year ago.

The bulk of the business is coming from the hog feed group, as has been the case for weeks. Poultry feeds are the next largest producer with layer feeds and concentrates showing some of the expected seasonal improvement. Most reports are of slow dairy feed sales although some plants are getting good tonnage out of cattle feeds.

Mills are on full five-day runs, one and two shifts. Some overtime has been required to catch up on a particular item but most plants held to normal shifts.

Pacific Northwest

Pacific Northwest feedstuffs prices appeared firmer during last week's trading under the influence of a seasonal demand increase for the principal ingredients, major Portland and Seattle mixers reported.

Oil seed meals, alfalfa meal and most feed grains made moderate price advances with meat and bone meal listed as the only exception when its value dropped $2.50 to $5 a ton.

Feed market trading followed a generally steady pace with feeders and mixers replenishing inventories as well as booking some items for December and January shipment.

There was a volume movement of formula feed despite the heavy seasonal marketing of turkeys with increased sales of dairy feeds and poultry mashes offsetting the reduced turkey feed sales volume.

Soybean meal prices gained $2 ton while cottonseed meal sold unchanged to $1 higher and off-shore shipments of copra meal earned $1 a ton more than last week's close.

Dehydrated alfalfa meal prices closed $1 higher while other items except meat meal held steady and unchanged.

Feed grain listings turned stronger with barley prices leading with a $2 advance. Milo prices were up $1.50 ton while oats values closed 50¢ higher and corn was unchanged to 50¢ higher.

Work Starts on Purina Mill in Ottumwa, Iowa

OTTUMWA, IOWA—Work started recently on a Ralston Purina Co. mill here, with Ralph Aberle of St. Louis, representing the Tunnecliff-MacDonald Construction Co. of Davenport and St. Louis, as project manager.

The structure will include tanks, storage bins and a 93-ft. tower, to be supported by pilings 30 ft. deep.

Mr. Aberle predicted the project will be completed by next June, if the weather is favorable.

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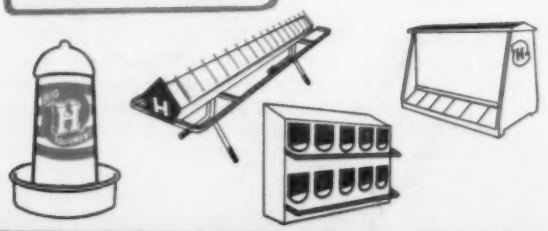

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